MAGIC TH2

ISDN & POTS Telephone Hybrid

Hardware/Software Manual

AVT Audio Video Technologies

M A G I C   T H 2

ISDN & POTS Telephone Hybrid

Hardware/Software Manual

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First select the menu item **Service** and then **Software Registration**. Select as product

MAGIC TH2 Telephone Hybrid

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Subject to change.

Release date: (02.06)

Content

INTRODUCTION

The *MAGIC TH2* system allows the forwarding of telephone calls to analogue and digital Audio interfaces.

The connection to the telephone network can be established either via an analogue POTS interface or via ISDN.

To optimise the calling signal each caller line has implemented its own digital *Echo Canceller*, an *AGC* (Automatic Gain Control) as well as an *Expander*.

The configuration of the system can be made via the Windows application included in delivery or via the front keypad of the unit. Optionally, the *MAGIC TH2 Keypad* is available for separate operation without a PC.

S A F E T Y

Introduction

The unit described has been designed to the latest technical parameters and complies with all current national and international safety requirements. It operates on a high level of reliability because of long-term experience in development and constant and strict quality control in our company.

In case of normal operation the unit is safe.

However, some potential sources of danger for person, material and optimal operation remain - especially if daily routine and technical errors coincide.

This manual therefore contains basic safety instructions that must be observed during configuration and operation. It is essential that the user reads this manual before the system is used and that a current version of the manual is always kept close to the equipment.

General Safety Requirements

To keep the technically unavoidable residual risk as low as possible, it is absolutely necessary to observe the following rules:

– Transport, storage and operation of the unit must be under the permissible conditions only.

– Installation, configuration and disassembly must be carried out only by trained personnel on the basis of the respective documentation.

– The unit must be operated by competent and authorised users only.

– The unit must be operated in good working order only.

– Any conversions or alterations to the unit or to parts of the unit (including software) must be carried out by trained personnel authorised by the manufacturer.
Any conversions or alterations carried out by other persons lead to a complete exemption of liability.

– Only specially qualified personnel is authorised to remove or override safety measures, and to carry out the maintenance of the system.

– External software is used at one's one risk. Use of external software can affect the operation of the system.

– Use only tested and virus-free data carriers.

Conventions

In this manual, the following conventions are used as text markers:

Accentuation: Product names or important terms

LCD Text: Labelling on the front display of the system

PC Text: Labelling in the PC software

TIP

The symbol **TIP** labels information which facilitates the operation of the system in its daily use.

NOTICE

The symbol **NOTICE** labels general notes to observe.

ATTENTION

The symbol **ATTENTION** labels very important advice that is absolutely to observe. In case of non-observance disfunctions and even system errors are possible.

1   C O N S T R U C T I O N

The functions of the *MAGIC TH2* are implemented in a single unit. The system is designed for mounting in a half 19" rack(1 U).

Optionally, a dual mounting kit is available (*MAGIC TH2 DUAL 19" Mounting Kit* ID: 800202) for installing two *MAGIC TH2* systems next to each other.

FIG. 1   **FRONT VIEW: MAGIC TH2 TELEPHONE HYBRID**

2   SYSTEM DESCRIPTION

The functional elements of the system are pictured in Fig. 2.

FIG. 2   FUNCTIONAL ELEMENTS OF THE MAGIC TH2 TELEPHONE HYBRID
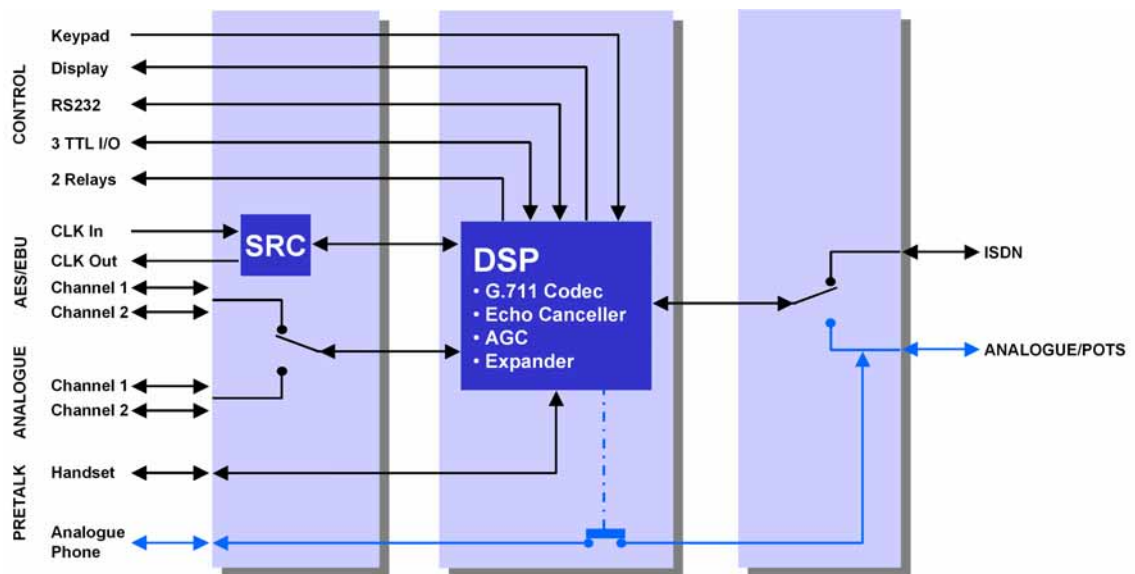
2.1   Functionality

The *MAGIC TH2 s*ystem incorporates an analogue *POTS* interface as well as an *ISDN* interface. The operating mode can be set with the help of a software. If the *ISDN telephone interface* is used, two independent telephone hybrids are available within one system (channel 1 and channel 2). If the *analogue POTS telephone interface* is selected, only one line can be used.

The complete signal processing is taken over by a digital *signal processor*. In this way the following functions are carried out:

–   G.711 Audio encoding and decoding

–   two independent *Echo Cancellers* for each line

–   two independent *AGC*s (Automatic Gain Control)

–   two independent *Expanders* (to suppress spurious signals)

–   control of the complete system (Keypad, Display, Relay, TTL, RS232)

As *ON AIR* Audio interfaces (input/output) for the mixing unit two independent analogue channels as well as a optional digital AES/EBU interface are available. If the AES/EBU interface is selected (optional AES/EBU software licence is necessary), both channels are multiplexed together (right/left channel). The input as well as the output possesses a separate digital Sample Rate Converter (SRC). For connection with an external clock a clock input and a clock output are available.

A separate **PRETALK** interface provides the possibility for Pre Talk. In the analogue POTS operating mode a standard analogue telephone can be connected to the system. Via this telephone the connection to the subscriber can be established or a call can be accepted and the Pre Talk can be conducted.

Alternatively, instead of a telephone, a **Telephone Handset / Headset** (Options: ID:800203/800204) can be connected. This has the advantage that it is possible to switch between **ON AIR** and **PRETALK** anytime. With a connected telephone this is only possible after the 'ignition' (= caller is **ON AIR**) if it has not been rung off.

In the ISDN operating mode only a telephone handset or a headset can be connected. Using a telephone is not possible.

The configuration and operation can be carried out primarily via the **front keypad** and the illuminated **display**.

The configuration and operation is especially comfortable via the **MAGIC TH2 Software** (see CHAPTER 5) included in delivery, which communicates with the system via the RS232 interface.

The most basic operating functions like accepting a call, dropping a connection and establishing a connection with a preprogrammed number can be carried out via three programmable **TTL contacts**. Two **relays** are available for status indication.

Optionally, the operation can be carried out via the **MAGIC TH2 Keypad** (see CHAPTER 6) that can be connected to the RS232 interface instead of the **PC software**.

3   **PUTTING THE MAGIC TH2 TELEPHONE HYBRID INTO OPERATION**

3.1   **Mounting**

With its dimensions (W × H × D) of 220 mm × 44,5 mm (1 U) × 220 mm the *MAGIC TH2* system can be either used as desktop device or mounted in a 19 inch rack. Corresponding 19" mounting brackets are included in delivery. Optionally, a mounting kit (ID: 800202) is available to implement two *MAGIC TH2* next to each other[1].

When mounting the unit please keep in mind that the bending radius of the cables is always greater than the minimum allowed value.

When the *MAGIC TH2* Telephone Hybrid is installed, please make sure that there is sufficient air ventilation: It is recommended to keep a spacing of ca. 3 cm from the openings. In general, the ambient temperature of the system should be within the range of +5°C and +45°C. These limits are especially to observe if the system is inserted in a rack. The systems works without ventilation.

TIP   The system temperature can be indicated on the display (*Menu Status Information* (see CHAPTER A1.4, Page 103))

During operation air humidity must range between 5% and 85%.

ATTENTION   **Incorrect ambient temperature and humidity can cause functional deficiencies.**
Operation outside the threshold values indicated above leads to a loss of warranty claim.

3.2   **Connection to the mains voltage**

The system can be operated with mains voltage in the range of 90 V and 253 V via the external power supply adapter included in delivery. The mains frequency can range from 45 Hz to 65 Hz. The maximum power consumption is 15W. The rack must be earthed according to the VDE Regulations. This can be carried out via the earthing screw on the back side of the unit.

The unit does not have a circuit closer and a circuit breaker. After plugging in the external power supply adapter the unit boots in a few seconds. In standby mode the AVT logo is shown on the display.

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[1]   In this way, you can also combine the TH2 with the products MAGIC DC7 and MAGIC AC1.

3.3   **Earthing of the system**

For EMC reasons an earthing via the earthing screw of the system must be carried out in either case.

ATTENTION   **Earthing**

A lacking earthing can cause functional deficiencies within the unit.

3.4   **Operating elements on the front side**

The system has an illuminated graphical display with a resolution of 160 x 32 Pixels and 21 operating buttons.

On the right next to the display there are two softkeys whose current functions are indicated on the display. In the middle there are two buttons for navigation (selection upwards/downwards), two buttons for accepting/dropping calls as well as an OK button. The numerical pad supports in addition to the numericals 0...9 also the '*'and '#'button. For entering text the numerical pad can also be used as a normal keypad.

The operation is similar to standard mobile phones.

FIG. 3   **OPERATING ELEMENTS ON THE FRONT SIDE**

Initiate call/
Accept call

Drop/
Lock Line/
Main Menu

Graphical
display

Softkeys

Navigation
buttons

Keypad for dialling/
Text entry

Confirm
entry/
Status window

B Channel
Shift
(ISDN only)
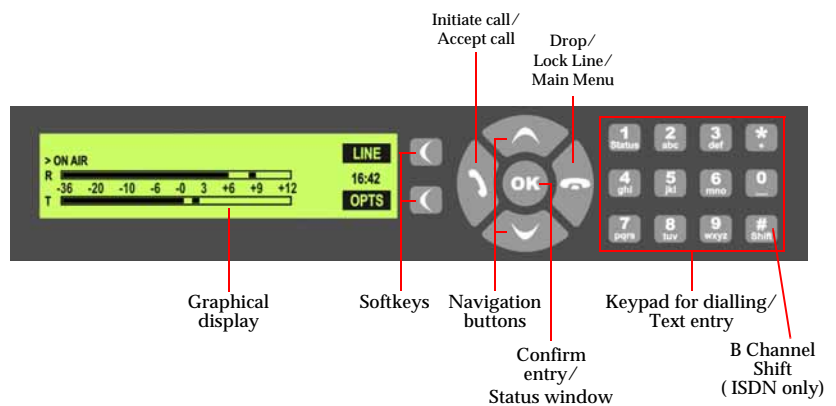
3.5   **Operating modes of the system**

The following figures show the system in the different operating modes and their respective cablings.

3.5.1   **Analogue POTS operating mode**

ATTENTION   **Earthing**

If the analogue POTS interface is in operation, the system must be earthed via earthing screw for EMC reasons. If the earthing is not carried out, the Audio signal can be faulty on the caller's side (humming).

The minimal wiring for the operation with an analogue telephone line is pictured in Fig. 4. Via the optional analogue telephone the Pre Talk can be carried out if required.

ATTENTION   **Connection of an analogue telephone or a telephone handset**

Please notice that the *HANDSET/PHONE* interface is implemented as **6-pole** Western socket. Standard telephones or handsets with 4-pole Western connectors must **not** be used because otherwise the contacts in the socket will be destroyed.

FIG. 4   MINIMUM WIRING IN ANALOGUE POTS OPERATING MODE
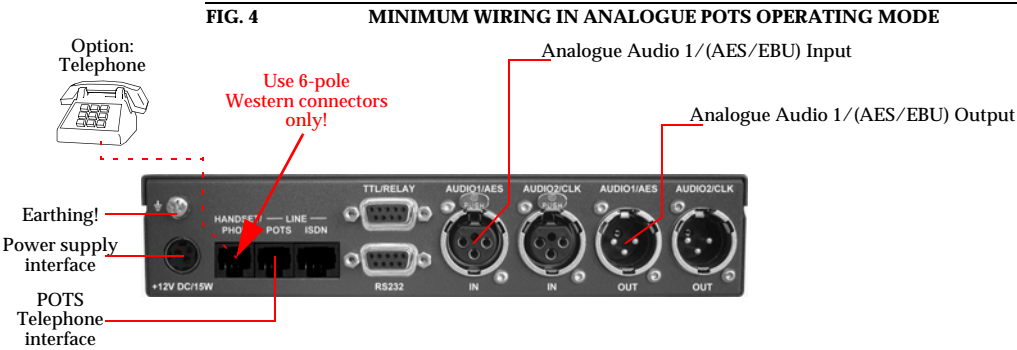
The maximum wiring with all options is shown in Fig. 5. The RS232 interface allows the connection with a PC with *MAGIC TH2 software* or the application of the *MAGIC TH2 Keypad* as alternative to the operation via the front keypad.
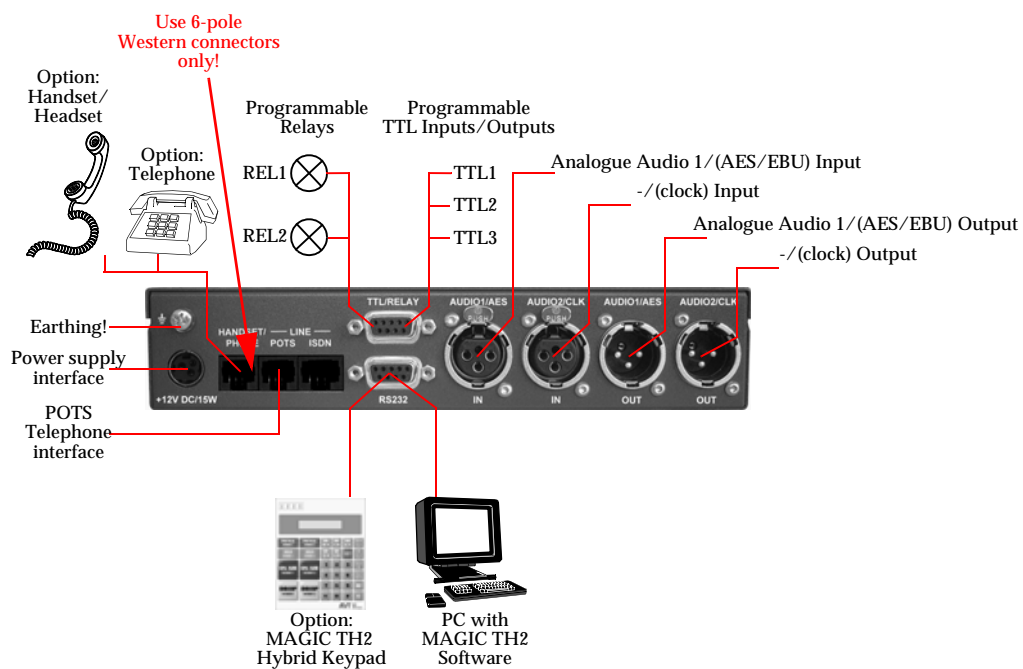
ATTENTION   **Connection of an analogue telephone**

Please notice that in case of using an analogue telephone only **Pin 3 & 4** of the *HANDSET/PHONE* interface must be used. The Pins 1, 2, 5 and 6 of the interface are used for connecting the handset and must not be occupied by the telephone.

FIG. 5   MAXIMUM WIRING IN ANALOGUE POTS OPERATING MODE

Use 6-pole
Western connectors
only!

Option:
Handset/
Headset

Option:
Telephone

Programmable
Relays

Programmable
TTL Inputs/Outputs

REL1

REL2

TTL1
TTL2
TTL3

Analogue Audio 1/(AES/EBU) Input

-/(clock) Input

Analogue Audio 1/(AES/EBU) Output

-/(clock) Output

Earthing!

Power supply
interface

POTS
Telephone
interface

Option:
MAGIC TH2
Hybrid Keypad

PC with
MAGIC TH2
Software

3.5.2   ISDN operating mode

In contrast to the analogue POTS operating mode, in the ISDN operating mode two independent telephone hybrids are available.

A handset or a headset can be connected for Pre Talk. Using an analogue telephone is not possible in this operating mode.
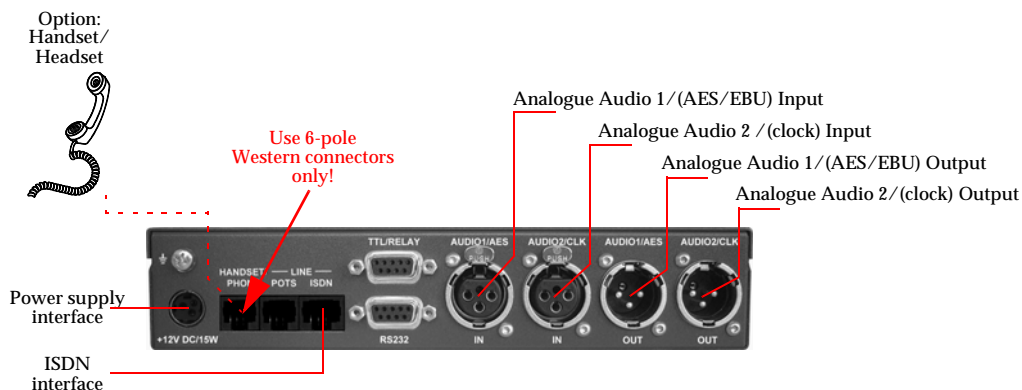
ATTENTION

⚠

Connection of a telephone handset

Please notice that the *HANDSET/PHONE* interface is implemented as **6-pole** Western socket. Standard handsets with 4-pole Western connectors must **not** be used because otherwise the contacts in the socket will be destroyed.

FIG. 6   MINIMUM WIRING IN ISDN OPERATING MODE

The maximum wiring with all options is shown in Fig. 7. Instead of the operation via the front keypad, the system can also be operated with the use of a PC with *MAGIC TH2 Software* or a *MAGIC TH2 Keypad* connected to the RS232 interface.

FIG. 7   MAXIMUM WIRING IN ISDN OPERATING MODE
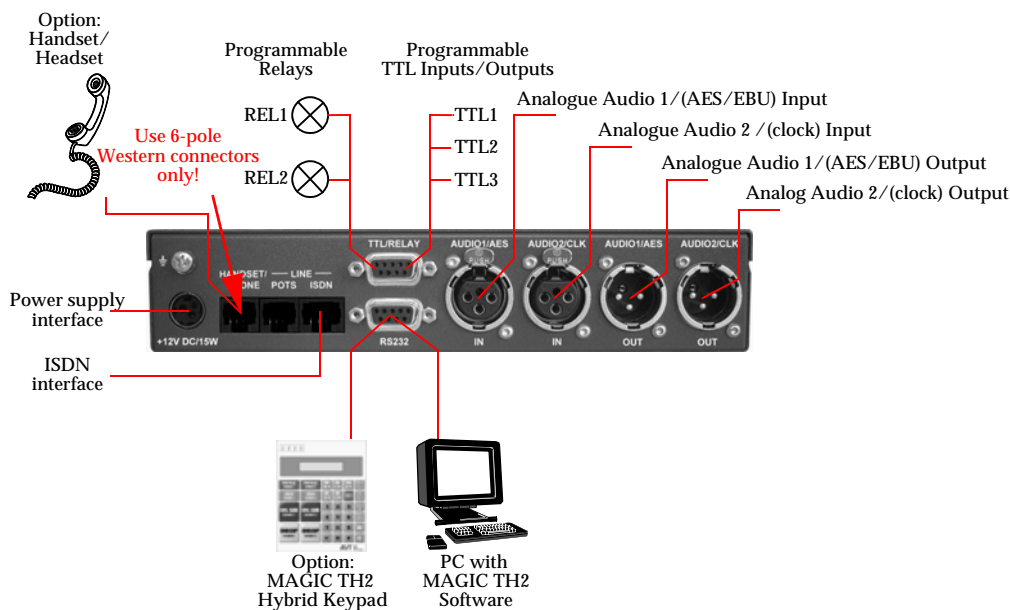
4   OPERATION VIA DISPLAY AND KEYPAD

In this chapter all significant settings to operate the *MAGIC TH2* system are-explained. An overview of the menu structure can be found in the annex under CHAPTER A1.

All configurations can also be set comfortably via the *MAGIC TH2 Software* included in delivery.

NOTICE   For details concerning most functions please see CHAPTER 5 of the software description.

4.1   Basic configurations

Below, some specific basic configurations of the *MAGIC TH2* are described in detail.

Menu reference number

NOTICE   All menus can be reached directly via a *Quick Menu* key sequence. Each menu item is marked with a numeral in the upper left corner (in the example on the left it is 3). To get from the main menu directly to a specific menu, please enter the key sequence Menu <Digit> <Digit> , in which <Digit> marks the respective reference number of the menu. Please notice that the reference number can change in accordance with the configuration.

4.1.1   Keypad lock

To avoid that keys are pressed unintentionally, you can activate a keypad lock. For activation please press the Menu key followed by the * key. If the keypad lock is activated, the display illumination is switched off immediately.

To deactivate the keypad lock, please enter again the key sequence Menu *.

4.1.2   Operating mode selection: Analogue POTS or ISDN

To set the operating mode *POTS* or *ISDN* the following steps are necessary:

NOTICE   If you are not in the main menu, please press the   key first.

– Press the Menu softkey.

– Please select via the navigation key ⌄ the option Operation Settings and press the Select softkey.

– Press again the Select softkey to get to the menu Line Mode.

– Now select the desired operating mode ISDN, ISDN Single Hybrid or POTS via the cursor keys ⌃ and ⌄ and confirm your selection via the Select softkey.
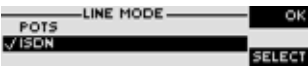
– You confirm your selection by pressing the Ok button or the Ok softkey.

– Press the ☎ key to get back to the main menu. Now you are asked if you want to Save Settings? . Via the Yes softkey, the configuration is stored permanently in the system.

TIP You reach the settings for the Line Mode directly via the key sequence: Menu 2 1

### 4.1.3 Audio interface selection: Analogue or digital

The **MAGIC TH2** has analogue as well as digital Audio interfaces (optional), which can be adjusted separately. The digital **AES/EBU interfaces** have an implemented **Sample Rate Converter** to adjust the digital Audio clock to the line clock. Additionally, clock inputs and outputs are available. To set the Audio interface please follow the instructions below:

NOTICE If you are not in the main menu, please press the ☎ key first

– First press the ❨ Menu softkey and then select System Settings via the ❨ Select softkey.

– Press the cursor key ⌄ twice until the option Audio is displayed in the menu.

– Via the Select softkey you reach the option Audio Settings.

– By using the cursor keys ⌃ and ⌄ please mark the option Audio Input or Audio Output and press again Select. Now, the options Analogue and Digital are displayed.

– Select the desired interface via the cursor keys ⌃ and ⌄ and by pressing the Select softkey.

– Confirm your selection by pressing the Ok button or via the Ok softkey.

– Press the ☎ key to get back to the main menu. Now you are asked if you want to Save Settings?. Via the Yes softkey the setting is stored permanently in the system.

TIP You reach the settings for the Audio Input respectively Audio Output via the key sequence: Menu 1 3 1 or Menu 1 3 2

4.1.4 PreTalk interface selection

In addition to the two **ON AIR** Audio interfaces, Pre Talk is possible via a separate interface. For setting the **PRETALK** interface please follow the instructions below:

NOTICE If you are not in the main menu, please press the ☎ key first.

– First press the ❨ Menu softkey and then select System Settings via the ❨ Select softkey.

– Press the cursor key ⌄ three times until the option PRETALK Interface is displayed in the menu.
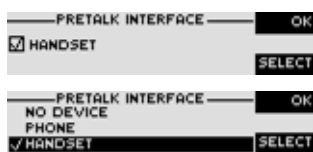
– Via the Select softkey you reach the option PRETALK Interface.

– Please mark the desired option via the cursor keys ⌃ and ⌄ .

– In the *ISDN* operating mode you can only activate or deactivate the Handset.

– In case of using the analogue *POTS operating mode,* the following options are available: No Device, Phone, and Handset.

– Please activate your selection by pressing the Select softkey.

– The selection is confirmed by pressing the Ok button or via the Ok softkey.

– Press the ☎ key to get back to the main menu. Now you are asked if you want to Save Settings?. Via the Yes softkey the setting is stored permanently in the system.

TIP   You reach the settings for the PRETALK Interface directly via the key sequence: Menu 1 4

4.2   **Working with the MAGIC TH2**

In the following paragraphs basic functions like initiating a call, dropping a connection, accepting a call etc. are described in detail.

NOTICE   If you are not in the main menu, please press the ![key] key first.

From the main menu you reach the status window via the Ok button.

4.2.1   **Call initiation**
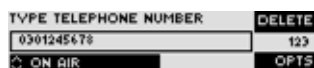
From the main menu just enter the phone number using the keys 0...9. After the first numeral the input field for the phone number is displayed automatically.

Via the Delete softkey misentries can be corrected.

With the use of the cursor keys ⌃ and ⌄ the Audio line ON AIR, HOLD and - if configured (see CHAPTER 4.1.4, Page 26) - PRETALK can be selected. As soon as the subscriber accepts the call, the incoming signal is displayed by the selected Audio line respectively the corresponding input is activated.

NOTICE   The Default Audio Line, which is automatically set after the connection is dropped, can only be configured via the PC software (see CHAPTER 5.6.1.1, Page 41).

After entering the number the connection is established by pressing the telephone receiver button ![receiver] .

Via the Opts. (Options) softkey the dialled number can be saved in the phone book (see CHAPTER 4.3.1, Page 30) or stored as Quick dial number (see CHAPTER 4.3.2, Page 30).

4.2.2   **Status display** - **Operation during a connection**

After pressing the telephone receiver button the subscriber is called and the status window is displayed.

In the **ISDN** operating mode the displayed window is split in two - one for each available B channel.

If the **ISDN Single Hybrid** operating mode or the **POTS** operating mode is used, only one channel is visible respectively.

An outgoing call is signalised by Call Out.... The dialled number (respectively the name if a phone book entry is selected) is displayed in the top line.

NOTICE   In the POTS operating mode the number respectively the name is displayed only for outgoing calls. The **CLIP**[a] function is not supported by analogue telephone lines.

a   CLIP = Calling Line Identification Presentation

If the connection has been established, the level indication for the incoming signal (Receive) and the outgoing signal (Transmit) is displayed.

current level for the incoming signal

The currently selected Audio line (in our example >ON AIR) is displayed via the level indication. The Audio line can be switched over by the use of the Line softkey. In the displayed selection dialogue the desired Audio line can be selected by pressing the Line softkey several times.

During the connection the volume of the caller signal can also be adjusted manually. Via the cursor keys ⌃ and ⌄ the level can be increased or decreased. The current level is displayed in dB for a few seconds. Additionally, a small arrow on the display for the received level (R) marks the current level for received calls.

TIP

Alternatively, you can activate the implemented *Automatic Gain Control*. You reach the settings for the AGC activation directly via the key sequence: Menu 2 4 1

With the help of the Opts. softkey it is possible to save the displayed number and to switch directly to the phone book.

4.2.3   Dropping a connection

The connection can be dropped by pressing the telephone receiver button ☎. If no other connection exists, the main menu is displayed after a few seconds.

4.2.4   Accepting a call

If the *MAGIC TH2* receives a call, the status window automatically displays the Call in signal.

NOTICE

Additionally, an audible signal can be activated in the system. The options are a beep of the unit itself and the possibility of displaying a short signal on the *PRETALK* Audio line (Handset). You reach the setting for the Ring Tone directly via the key sequence: Menu 2 3

The call is accepted directly via the telephone receiver button ☍. The caller signal is displayed on the selected Audio line, which can be set via the Line softkey.

The call is rejected by pressing the telephone receiver button ☎.

4.2.5   B channel connections (only in ISDN mode)

In the *ISDN* operating mode two separate telephone hybrids are available because of the two independent B channels, which means you can establish two connections with different subscribers simultaneously.

To switch to the second channel please press the Shift key (#). The selected channel is displayed via an inverted display of the telephone number respectively the name. All further steps for operation are identical with the operation when there is only one subscriber. The channel can be switched anytime.

NOTICE

If you want to drop a connection, please be sure that you select the right channel.

4.3 **Comfort functions**

4.3.1 **Redialling**
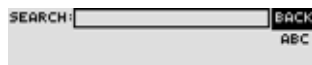
You reach the redialling function by pressing again the telephone receiver button for the line on which currently no connection is established. In the list the subscribers recently called are displayed. In the input field Search you can search for a certain subscriber or select a subscriber from the list via the cursor keys and .

For selecting the subscriber, please press again the telephone receiver button .

NOTICE To enter characters, please use the alphanumeric keypad. The desired character can be reached by pressing the respective key several times. For instance, to enter 'K' you must press the'5' key twice. Misentries can be corrected via the Delete softkey.
To switch between upper and lower case press the SHIFT key. The display changes from ABC to *abc*.

4.3.2 **Using the phone book**

The system incorporates a comfortable phone book function. The phone book can be reached from the main menu via the Names softkey.

In the input field Search you can search for a certain subscriber. As soon as you enter a character, the phone book entries in demand are retrieved.

Alternatively, you can select a subscriber from the list via the cursor keys and .

The following functions, which you can select via the Select softkey, are implemented by the Opts. (Options) softkey:

– New Entry: Via this function you can edit a new phone book entry.
First enter the name and confirm your entry with Ok.

Afterwards, please enter the phone number of the subscriber, which you also confirm with Ok.

– Edit: Via this function you can edit already existing phone book entries.

– View: The selected phone book entry is displayed with name and phone number.

– Delete Entry: The selected phone book entry is deleted. For safety reasons you have to confirm that you really want to delete the entry.
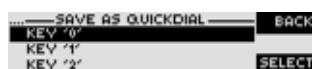
– Save as Quick dial: Your 10 most important phone numbers can be programmed as Quick Dial under the numerical keys '0' ... '9'. Select the key which you want to use for programming the phone number.

To activate a Quick Dial, from the main menu just press the desired Quick Dial number for at least 3 seconds. The connection to the subscriber is established automatically.

TIP Just as the configuration menus the phone book functions can also be reached directly via the *QuickBook* function. Please press the following key sequence:
Names Opts. <Digit>
Example: Save as Quick dial - Names Opts. 5

4.3.3   Configuration management

The *MAGIC TH2* differentiates between System Settings and Operation Settings.

System Settings are settings, which do **not** change during normal operation, like for instance language, date/time etc. These parameters can**not** be saved in a preset since a configuration is usually only required when putting the system into operation.

Operation Settings, like for instance the line interface ISDN or POTS, Ring Tone, Signal Processing etc., must possibly be reconfigured depending on the respective application. To easily recall recurrent configurations you can store up to 10 presets in the system.

The Presets menu is reached by pressing the Menu softkey once and the cursor key ⌄ twice followed by a confirmation via the Select softkey.

In the input field Presets you can search for a certain configuration. As soon as you enter a character, the entries in the Presets list in demand are retrieved.

Alternatively, you can select a configuration from the list via the cursor keys ⌃ and ⌄ .

By pressing the Ok button the configuration is loaded immediately.

The following functions, which you can select via the Select softkey, are implemented by the Opts. (Options) softkey:

– Load: The stored configuration is loaded.

– New: By the use of this function you create a new configuration. All current Operation Settings are saved.

– Save: The currently selected configuration will be overwritten with the current Operation Settings. For safety reasons you have to confirm your selection.

– Delete Preset: The currently selected configuration will be deleted. For safety reasons you have to confirm your selection.

NOTICE If the configuration has changed, you are asked if you want to Save Settings? when you leave the configuration menu. Via the Yes softkey the setting is stored permanently in the system. This configuration is loaded automatically by the system after the connection to the power supply.

4.3.4   **Sending DTMF tones (Option)**

If the fee-based option **DTMF** is activated in your system (see CHAPTER 8), you have the possibility to send DTMF tones on the one hand and, on the other hand, you can analyse DTMF tones via the PC software (see CHAPTER 8).

DTMF tones can be generated directly via the keypad of the system by pressing the numerical keys '0'...'9', '*', or '#' during a connection.

NOTICE   Since the Shift key ('#') is used for switching between the two B channels (only in ISDN operating mode), it is necessary to keep the key pressed for 1 second to send the '#' DTMF tone.

4.3.5   **Locking of lines**

To avoid further calls a caller line can be locked. A line can only be locked if no connection exists. In this case the callers hear the **Busy** signal. Outgoing calls are still possible if the switch respectively the Private Branch Exchange (PBX) is not already busy

NOTICE   The locking of Audio lines is only available in the operating modes ISDN or ISDN Single Hybrid.

Please go to the status window by pressing the Ok button.

NOTICE   If you are not in the main menu please press the key first.

Now keep the key pressed for one second. The display changes for the selected channel from Disconnect to Locked.

NOTICE   To switch between the two B channels please use the Shift key ('#').

By pressing the key again, the selected B channel is unlocked.

5   **WINDOWS PC SOFTWARE**

The configuration of the system can be carried out comfortably with the use of the Windows PC software included in delivery.

5.1   **Hardware requirements**

The PC used must meet the following minimum requirements:

– IBM PC AT, IBM PS/2 or 100% compatible

– Pentium Processor (> 500 MHz) recommended

– Windows 2000/XP

– ca. 600 kByte available RAM

– 5 MB available hard disk space

– Screen resolution 800 x 600 Pixel

– at least one available serial interface RS-232

– Microsoft, IBM PS/2 or 100 % software compatible mouse

5.2   **User Registration**

To get always information about the latest software automatically, please register on our homepage:

http://www.avt-nbg.de

First select the menu item **Service** and then **Software Registration**. Select as product

MAGIC TH2 Telephone Hybrid

– and enter your contact details. You must indicate a valid email address in any case.

5.3   **Installing the Windows PC software**

Please insert the CD included in delivery in your CD-ROM drive. The software automatically starts your internet browser. Possible safety warnings can be ignored for the moment. Press under *Install Software* the *MAGIC TH2* button. Subsequently, the setup program is executed.

Alternatively, the software can be installed directly from the CD. You can find the installation file *setup.exe* in the folder *Software\MAGIC TH2* on the CD.

Please follow the instructions of the installation routine.

After the installation please start the software by clicking on the **MAGIC TH2** symbol.

Please connect your PC via a serial 1:1 cable (only Pin 2 and Pin 3 are used, Pin 5=Ground) with the system.

The standard **COM-Port** settings are: **PC (19200 Baud)**

Operating via the Windows PC software

In the following chapters, all functions of the PC software are described in detail.

5.4 The MAGIC TH2 main window

After starting the *MAGIC TH2 Software*, the main window is displayed automatically (see Fig. 8).

The connection status between PC and system is displayed in the bottom right corner of the window:

PC ONLINE: Connection is okay.

PC OFFLINE: Connection with PC is faulty

Following further status messages are possible:

PC ONLINE ALARM: Upcoming alarm
(see *System Monitor*, green-dark green blinking)

ISDN REMOTE: A remote connection exists
(red-white blinking)

ISDN REMOTE ALARM: Upcoming alarm in remote system (blue-dark blue blinking)

NOTICE If the connection is faulty, please check the following points:
– External power supply of the system is plugged in (display available)
– Serial 1:1 cable is connected with PC and system
– Correct COM port and correct baud rate are selected in the software (*Configuration → COM Port*, see Page 69)

FIG. 8   MAIN WINDOW OF THE MAGIC TH2 SOFTWARE
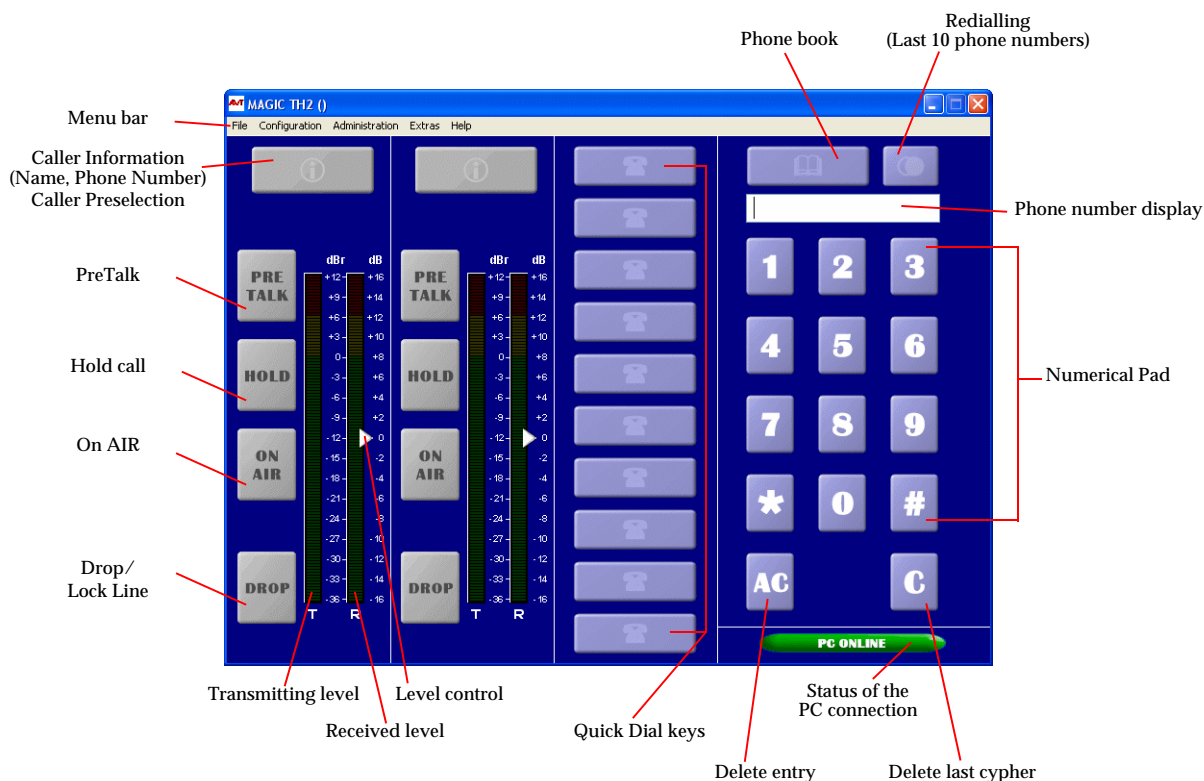
5.4.1 Operating elements

5.4.1.1 Info key

On the **INFO** button the information about the caller is shown. If transmitted the phone number of the caller is displayed. If additionally a phone book entry is available, the number and the caller's name are displayed.

By pressing the **INFO** key the **phone book** (see CHAPTER 5.4.1.7) is opened and the entry can be edited immediately or it is possible to preselect a caller to the selected line. If a preselection is available you must press only one of the buttons **PRETALK, HOLD** or **ON AIR** to initiate a call. To delete a preselection press the **CLEAR** button (see Fig. 9).

5.4.1.2 Status keys: PRETALK (EXT. PHONE), HOLD, ON AIR, DROP

Via the keys **PRETALK, HOLD**, **ON AIR** and **DROP** the line status is selected.

The button **PRETALK** switches the caller in Pre Talk. This button is only displayed if in the configuration **Configuration → Basic Settings → General → Pretalk Interface** the option **Handset/Headset** is selected

If the option **External Phone** is selected, the button **EXT. PHONE** is displayed instead of the **PRETALK** key. Initially, it cannot be used. When the analogue telephone is picked up, the key colour changes to green. Now, the button can be used and it is possible to switch between **HOLD**, **ON AIR** and the external telephone anytime during an established connection.

ATTENTION If the telephone receiver is dropped while the caller is **HOLD** or **ON AIR** the caller cannot be switched back to the phone.
If the telephone receiver is dropped and you press the button **EXT. PHONE**, the connection is dropped.

Via the **HOLD** key the caller is hold on line. The caller hears the Audio signal which is transmitted via the Audio input.

Instead of the program an Audio sequence stored previously in the system (**Recorded Hold Signal**) can be displayed ((see CHAPTER 5.6.1.1.3).

By pressing the button **ON AIR** the caller is connected through via the corresponding Audio output.

Via the **DROP** key the connection to the caller can be dropped.If no connection exists the line is locked by pressing the key **DROP** a second time (**LOCK**). In this case the caller hears the **Busy** signal. The line is unlocked by pressing the key again. Outgoing calls are still possible in the locked status.

NOTICE The locking of Audio lines is only available in the operating modes ISDN or ISDN Single Hybrid (see CHAPTER 5.6.1.1.1).

When there is an **incoming** call, **all** keys are displayed in yellow and blinking. Respectively, each of these keys can be selected. In this way, you can switch a caller directly **ON AIR** for instance.

In contrast to this, when there is an **outgoing** call, the keys **PRETALK, HOLD** and **ON AIR** are displayed yellow and static whereas the key **DROP** is displayed yellow and blinking. Only the **DROP** button can be selected.

5.4.1.3 Level indicators and level regulator

The outgoing transmitting level (*T*ransmit) as well as the received level (*R*eceive) of the caller are displayed via separate level meters . Additionally, the received level of the caller can be manually increased or decreased in the range of -16dB and +16dB.

TIP Alternatively, you can activate the implemented *Automatic Gain Control* (see CHAPTER 5.6.1.1.2).

5.4.1.4 Quick Dial keys

For a quick dialling the Quick Dial keys are available. Please notice that if you press the Quick Dial key, the telephone number and the name is only displayed on the phone book button.To establish a connection, please press one of the following buttons: *PRETALK*, *HOLD* or *ON AIR*. If the called partner accepts the call, he or she is immediately switched in the corresponding status.

The programming of the *Quick dial* keys is described in detail in CHAPTER 5.6.1.2.3.

TIP If you press a *Quick dial* key for 2 seconds the phone book will be opened and a direct programming of the quick dial is possible.

5.4.1.5 Numerical pad

Via the numerical pad *0* ...*9* and the special keys *#* and *∗* (for special functions like e.g. listening to voice mails of an answering machine) the desired telephone number can be entered. The number is displayed on the phone number field.

NOTICE Only telephone numbers with a maximum of 20 digits can be entered.

You can correct your entry using the *AC* key and *C* key. *AC* (All Clear) deletes the entire entry, *C* (Clear) deletes only the last character.

TIP Alternatively, click with your mouse in the display for the telephone number and use the numerical keys of your PC keyboard. To delete individual characters use the ← key respectively the *DEL* key.

NOTICE If the entered phone number corresponds with a number saved in the phone book (see CHAPTER 5.4.1.7), the corresponding name is automatically displayed on the phone book button.

5.4.1.6 Redialling

Via the redialling button the ten last dialled telephone numbers are available. The current position in the redialling list is indicated by the figures 1 ... 10.

Please notice that by pressing the redialling key the telephone number is only displayed. To establish a connection, please press either the *PRETALK*, *HOLD* or *ON AIR* key additionally.

5.4.1.7   Phone book

With the use of the phone book key telephone numbers can be saved comfortably in the phone book.

NOTICE   The phone book is stored in the *MAGIC TH2* system and **not** in the PC. Via the menu *Extras → Import/Export* a phone book can be imported from a data file or exported as data file ((see CHAPTER 5.8.3).

To open the phone book, please press the phone book button (see Fig. 9).

In the *Search* field you can search directly for a name in the phone book. As soon as a match is found the corresponding record is displayed with *Name* and *Number*.

FIG. 9   **PHONE BOOK**
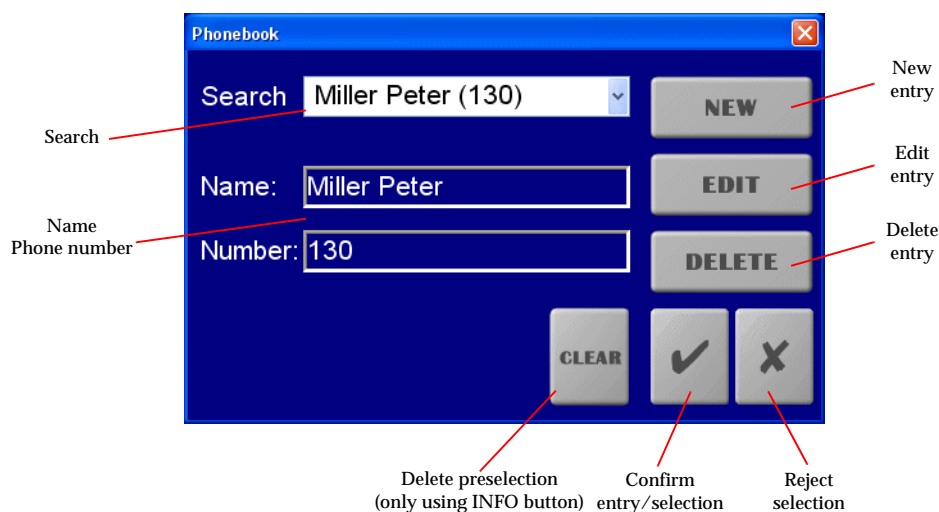
To create a new entry, please press the button *NEW* whereby the window *New Phone Book Entry* is displayed. There you can enter the name and the phone number.

ATTENTION   The name entered in the phone book has to be unique. Identical names are not permitted.The best way to provide a clear identification is to enter the last name and the first name.
If the name already exists, the error message *Name already exists* is displayed.

FIG. 10   **EDIT NEW PHONE BOOK ENTRY**
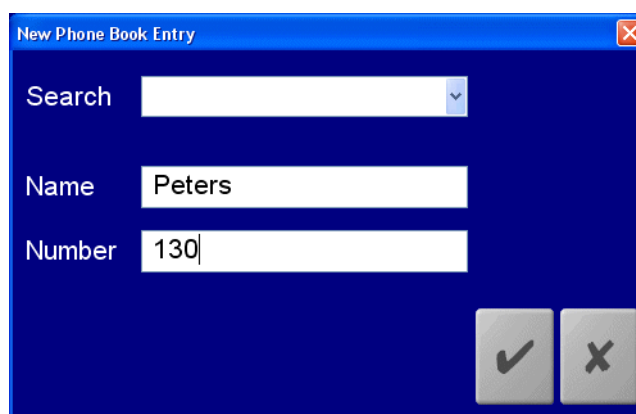
EDIT

By the use of the *EDIT* button an already existing record can be edited. The search function is not available here.

DELETE

Via the button *DELETE* the currently displayed record is deleted.To avoid unintentional deleting, you have to confirm that you really want to delete the entry with *Yes*.

FIG. 11   **SAFETY CONFIRMATION**

Do you really want to delete this entry?

Ja   Nein
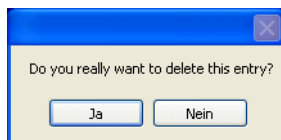
CLEAR ✔ ✗

By using the *CLEAR* button a preselection of a line can be deleted. This function is only available if you open the Phone book by pressing the *INFO* button (see CHAPTER 5.4.1.1).

By using the ✔ button you confirm your entry respectively your selection.

By using the ✗ button you reject the entry respectively your selection

5.5   **Menu File**

FIG. 12   **MENU FILE**
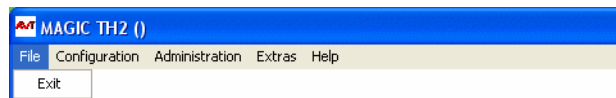
5.5.1   **Submenu Exit**

Via the submenu *Exit* you exit the *MAGIC TH2* software.

5.6   **Menu Configuration**

FIG. 13   MENU CONFIGURATION
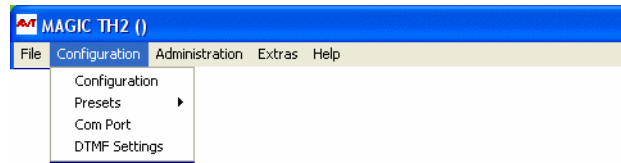
5.6.1   **Submenu Configuration**

Via the submenu *Configuration* the system can be configured comfortably. It is distinguished between *Basic Settings*, which do not have to be changed during the operation and the actual *Configuration* for the current applica- tion. In contrast to a configuration, the basic settings can**not** be saved as *Pre- set* (Configuration (see CHAPTER 5.6.2).

5.6.1.1   **Configuration**

All settings made under *Configuration* can be saved as *Preset*.

5.6.1.1.1   **Line Interface**

Via the option *Line Interface* the ISDN interface and the POTS telephone in- terface can be configured.

FIG. 14   LINE INTERFACE
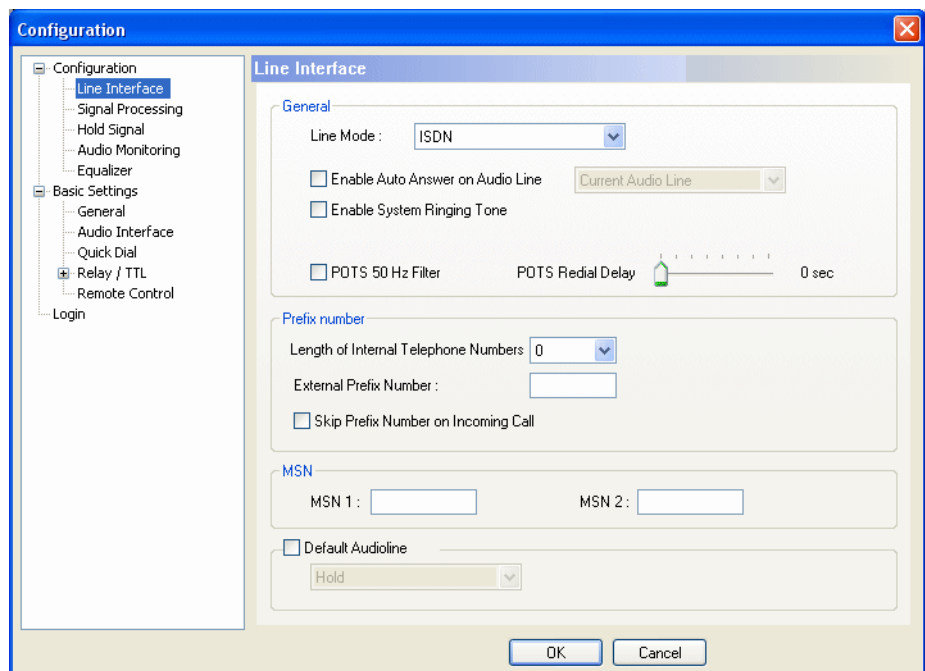
General

- Via the option *Line Mode* you can select the line interface. The following configurations are possible:

– **ISDN Single Hybrid**: The system is operated with ISDN, but only one channel of the two available B channels is used. If there is a call on the second channel, the system signalises '**Line busy'**. Only the **Audio1/AES IN/OUT** interfaces (see Fig. 6 and Fig. 7) are used.

– **ISDN**: The system is connected to the ISDN and two independent hybrids are available.

– **POTS**: The system is connected to an analogue telephone line. In this operating mode only one channel is available in general. Only the **Audio1/AES IN/OUT** interfaces (see Fig. 6 and Fig. 7) are used.

• Via the function **Enable Auto Answer on Audio Line** the auto answer can be activated. Under the option **Current Audio Line**, **PRETALK**, **HOLD** or **ON AIR** you can set which Audio line is activated automatically after the call has been accepted.

• It is possible to activate a ring tone as audible signal for incoming calls via the function **Enable System Ringing Tone**.

• If you select **Enable Ringing Tone on Handset/Headset** incoming calls can be signalised via the **Pre Talk** Audio line if a telephone handset or headset is connected.

• If the **POTS 50 Hz Filter** is activated, a disturbing 50 Hz humming is filtered out. The spurious signal is injected via the POTS connection in the system. The reason is in the majority of cases an incorrect cabling of the private branch extension.

• Via the slide control **POTS Redial Delay** it is possible to insert a pause before redialling - directly after disconnection - in a range of **0 ... 7** seconds.

Prefix number

NOTICE   The following configurations are only necessary if the system is operated with a private branch exchange.

• Under **Length of internal telephone numbers** the length of your internal telephone numbers is set. Subsequently, the prefix number is automatically dialled first if the length of the telephone number exceeds the length specified in this setting.
If you do not want to use this function or if you operate the system with a main telephone station, enter **0**.

Examples:

> Length of internal telephone numbers: 3
> Entered telephone number: 130
> Dialling: 130
>
> Length of internal telephone numbers: 3
> Entered telephone number: 5271130
> Dialling: **0** 5271130

- Under **External prefix number** please enter the prefix number that you need to get an external line. In most cases it is **0**.

You need to enter the prefix number at any rate if you work with a private branch exchange because otherwise the system does not wait for the free-line signal. Without dialling the prefix number at a private branch extension the telephone number is transmitted too fast and no connection can be established.

- Some private branch exchanges transmit telephone numbers with prefix number to the system. If you enable the function **Skip prefix number on incoming call**, you can save a displayed number in the phone book without prefix number since the prefix number of the displayed number is deleted automatically.

MSN (Multiple Subscriber Number)

NOTICE A MSN can only be set if an ISDN operating mode is selected (see Page 41 - General).

Normally, a MSN entry is not required. However, if you operate further units on your ISDN interface, you can allocate a certain number to a certain unit by a MSN entry. When you order an ISDN user port in Germany, you usually receive three MSN, which you can use for your connected units.

Example: You operate a telephone, an ISDN PC card and a **MAGIC TH2** system using one ISDN interface. You received the following MSN from your provider: 5271011, 5271012, 5271013.
If no MSN is allocated to the system, all three devices respond to an incoming call no matter which of the three telephone numbers has been called. However, if a MSN is allocated to each device, the unit only responds if the corresponding number is called. For instance, if you enter the MSN '5271013' for the **MAGIC TH2**, the system only signalises an incoming call if the subscriber has dialled the '5271013'. This example, however, requires that you enter the same MSN for **MSN 1** and **MSN 2**.

Please enter the desired MSN in **MSN 1** respectively **MSN 2**. Of course, you can allocate the same MSN to both B channels. Please notice that a MSN is always entered **without** the area code.

In the operating mode **ISDN Single Hybrid** only **MSN 1** can be set.

NOTICE For some private branch exchanges the entry of a MSN is obligatory since otherwise no operation is possible.
If you cannot establish a connection to a subscriber with the **MAGIC TH2**, however, you are sure the ISDN is working correctly, please enter a MSN on trial.

Default Audio Line

- Via the function **Default Audio Line** you can select which Audio line is set automatically after the connection has been dropped. The options are: **PRETALK**, **HOLD** or **ON AIR.**

5.6.1.1.2 Signal Processing

With the option *Signal Processing* configurations to optimise the caller signals can be carried out. It is possible to configure the *AGC* (Automatic Gain Control), the *Echo Canceller* as well as the *Expander*.

FIG. 15 SIGNAL PROCESSING
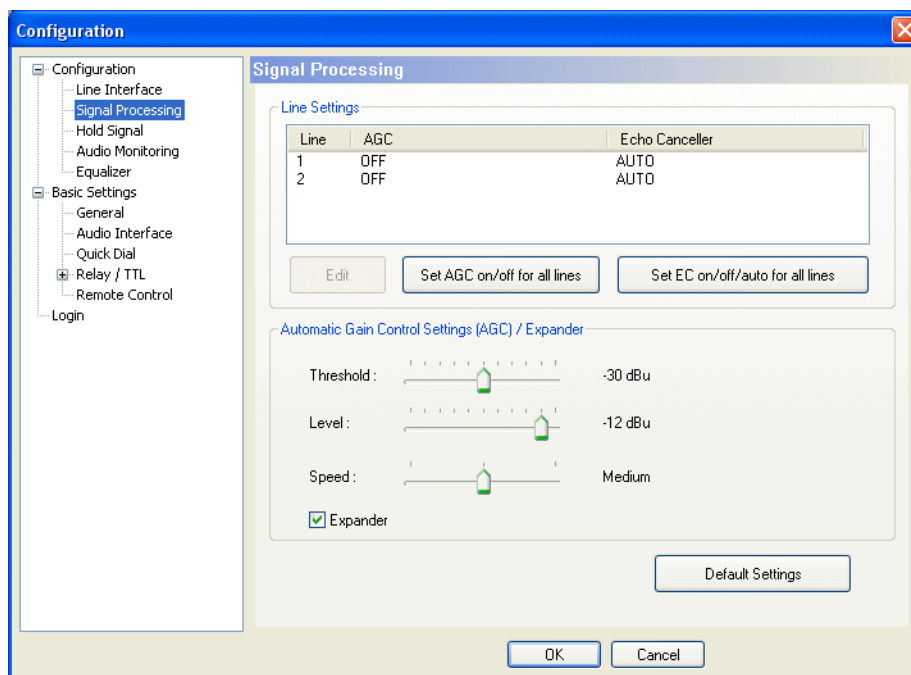
Line Settings

- A separate Automatic Gain Control (*AGC*) can be switched on for both channels.

ATTENTION An Automatic Gain Control is reasonable if you do not have the possibility for Pre Talk during which the level can be adjusted.

But: An AGC is no wizard. Extremely low callers cannot be boosted boundlessly. Extremely loud callers cannot be toned down boundlessly.

Please select the desired line with your mouse and press the button *Edit*, which opens the configuration window. To switch off the *AGC* select *Off*. To switch it on select *On*.

FIG. 16 CONFIGURATION AGC AND ECHO CANCELLER
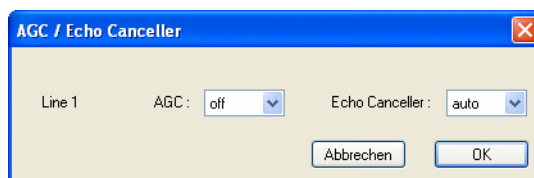
Via the button *Set AGC on/off for all lines* you can switch on respectively switch off the *AGC* for all lines.

- An *Echo Canceller* can be set on or set off separately for each channel.

In general, the use of the Echo Canceller is recommended. When a subscriber calls on the hybrid with an **analogue** telephone, a line echo is produced which can interfere with the incoming signal. Digital telephones (e.g. ISDN or mobile phones) do not produce these line echoes. In this case an Echo Canceller would worsen the incoming signal. For this reason the hybrid sends a short test tone when a connection is established (only in the *Auto* mode) and detects the level of the echo. If a certain threshold value is not exceeded, the Echo Canceller is set off because the use of a digital phone on the counterpart is anticipated. If the level is too high, the Echo Canceller is set on automatically.

But: Echo Cancellers can only suppress echoes if the delay of the signal lies within a certain scope. Telephone connections via satellite have such a long delay that the Echo Canceller cannot work properly anymore.

Select the desired line with your mouse and press the button *Edit*, which opens the configuration window (see Fig. 16). To generally set the *Echo Canceller* off select *Off*.

If you always want to have the *Echo Canceller* activated select *Always ON*. In this case, no test tone to detect the echo is sent.

If your callers are put through by a Call-In-Center , you should use the option *Always ON* because otherwise the Echo Canceller is possibly not adjusted correctly.

In the *Auto* mode, the test tone is namely send between the hybrid and the Call-In-Center - and not, as required, between the hybrid and the caller. Since most of the lines of Call-In-Centers are digital ones, the Echo Canceller would be turned off internally. However, if the caller uses an analogue telephone, disturbing echoes would be audible.

If the option *Auto* is selected, the Echo Canceller is switched on or switched off dynamically. The system sends a short test tone to determine if an Echo Cancelling is required or not.

Via the button *Set EC on/off/auto for all lines* you can select the same operating mode of the *Echo Canceller* for all lines.

Automatic Gain Control Settings (AGC)/Expander

The correct functioning of the *AGC* can be optimised via several parameters.

- *Threshold* : The *AGC* does not start before the signal exceeds the threshold value set here. The default setting is -30 dBu.

- *Level* :The level set here corresponds with the average desired level. Please consider sufficient head room. The default setting is -12 dBu.

- *Speed* : Depending on the desired speed of the level adjustment (*Slow* or *Fast*) the setting of the AGC speed can be configured here. The faster the AGC must work the more noticeable are the inconsistencies. If the set speed is too slow, the caller signal is too low or too loud on average. The default setting is *Medium*.

- An ***Expander*** tones down the caller signal automatically, if its level falls below a certain threshold value. The aim is to completely filter out background noises of callers who are not currently speaking.The ***Expander*** is activated by checking the respective box.

- With the use of the key ***Default Settings*** the default settings named above can be configured and the ***Expander*** can be activated.

5.6.1.1.3 HOLD Signal

The configuration of the *HOLD* signal can be carried out under *Hold Signal*.

FIG. 17   **RECORDED HOLD SIGNAL**
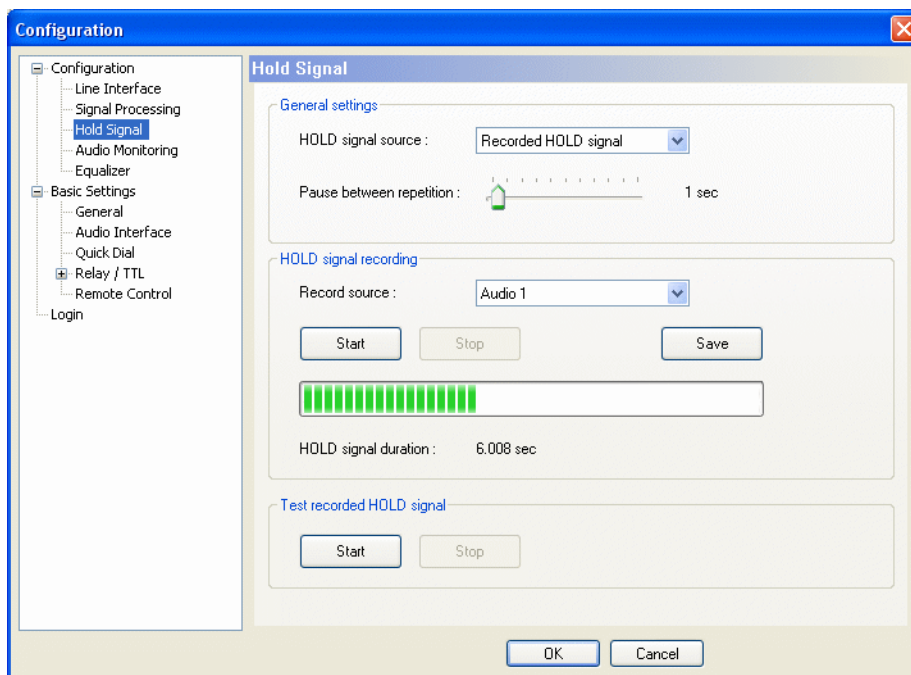
General settings

- Under the setting *HOLD signal source* you can select the *HOLD* signal that you want to use.

  With the option *ON AIR* the signal which is transmitted via the *AUDIO 1* respectively *AUDIO 2* input interface is used as *HOLD* signal. In this setting no further options can be configured.

  If you select *Recorded Hold Signal*, the caller hears the Audio signal stored in the system. The signal is identical for both lines (in ISDN operating mode).

- With the use of the slide control *Pause between repetition* you can set the pause between the repetitions of the recorded signal. The pause time ranges from *0 to 30 Seconds*.

HOLD signal recording

- To record a *HOLD* signal you can select the line on which the signal is recorded under *Record source*. The options are: *Audio 1*, *Audio 2* or *Handset/Headset*.

- Via the button *Start* you start the recording. With *Stop* the recording is stopped. With *Save* the recorded signal is saved in the permanent memory (FLASH-EPROM) of the system.

- The duration of the *HOLD* signal is displayed under *HOLD signal duration*. The maximum duration of a recorded signal is *6,383 seconds*.

Test recorded HOLD signal

• To test the recorded signal it can be played back. The button *Start* starts the play-back of the recording and by *Stop* it is stopped.
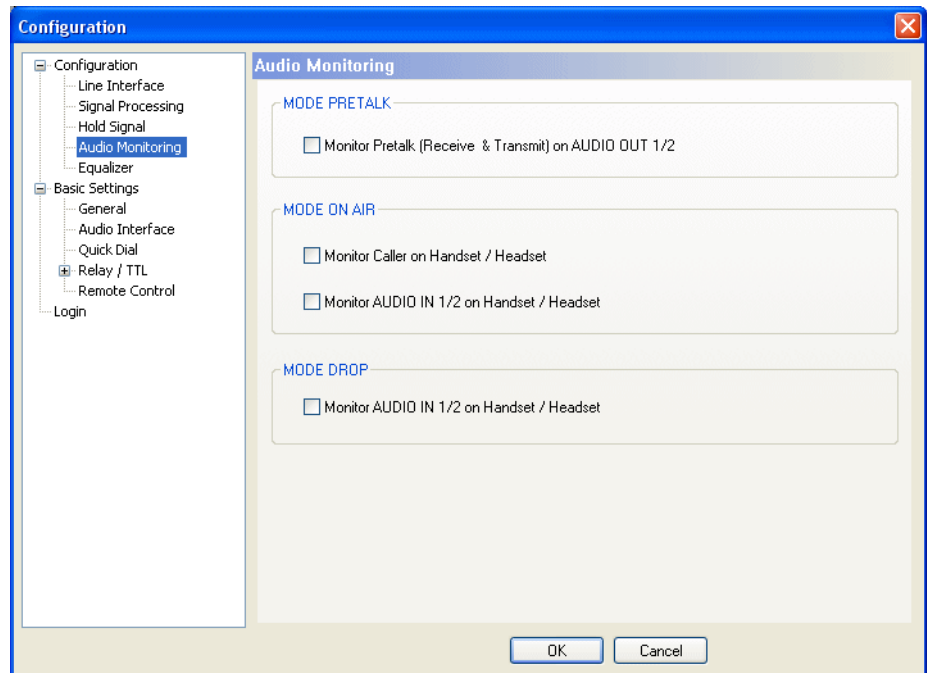
TIP	You can import or export a recorded *HOLD* signal using the *Import/Export* function under *Administration* (see CHAPTER 5.8.3).

5.6.1.1.4   Audio Monitoring

The function *Audio Monitoring* provides several possibilities to monitor all available Audio signals.

FIG. 18   AUDIO MONITORING

Mode PRETALK

- After the function *Monitor Pretalk (Receive & Transmit) on AUDIO OUT 1/2* is activated the PreTalk (caller is in *PRETALK*) is displayed on the Audio interfaces *Audio Out 1* respectively *Audio Out 2*. The received signal and the transmitting signal are mixed and provided as Audio composite signal.

Mode ON AIR

- The function *Monitor Caller on Handset/Headset* enables a monitoring of the caller signal via the *Handset* Audio interface if the caller has been switched *ON AIR*.

  If there is one caller *ON AIR* and a second caller in *PRETALK* only the normal *PRETALK* function is active.

- A monitoring of the Audio signal via the *Audio In 1* respectively the *Audio In 2* interface on the *Handset* Audio interface is possible by activating the function *Monitor AUDIO IN 1/2 on Handset/Headset*, if a caller has been switched *ON AIR*.

If both options are activated, a composite audio signal is generated.

Mode DROP

- If there is not a connection established on **any** line, a monitoring of the Audio signal of the ***Audio In 1*** respectively ***Audio In 2*** interface is possible via the ***Handset*** Audio interface by enabling the function ***Monitor AUDIO IN 1/2 on Handset/Headset***.

5.6.1.1.5   **Equalizer**

With the use of the *Equalizer* the acoustic properties of the caller signal can be adjusted easily.

FIG. 19   EQUALIZER
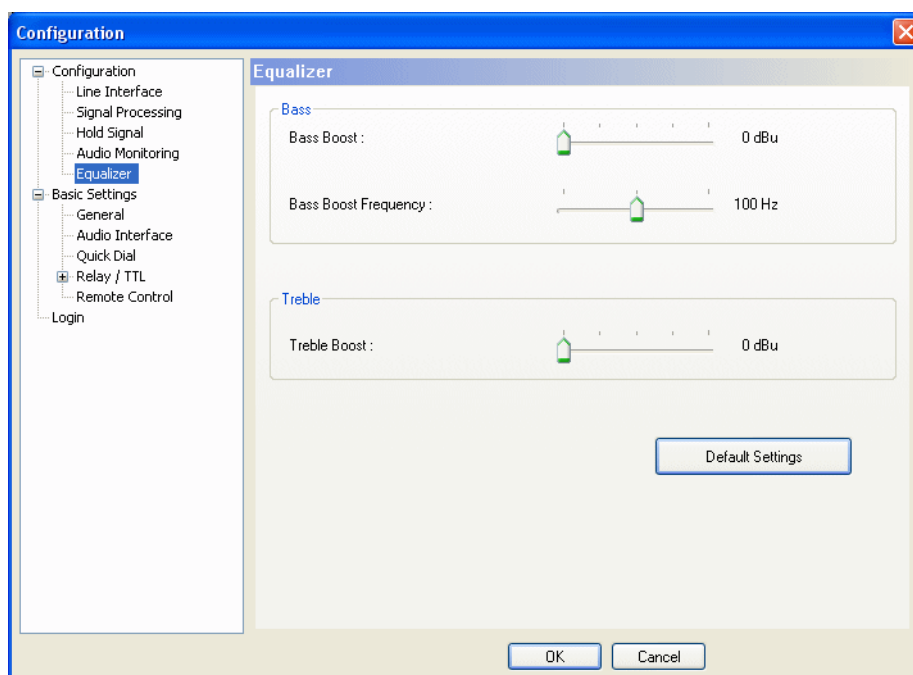
Bass

- Via the slide control *Bass Boost* the bass can be boosted in the range of *0 and 12 dBu*. The default value is *0 dBu*.

- The lower cut-off frequency of the bass boost can be changed using the *Bass Boost Frequency* control. The cut-off frequency can be set to *50 Hz*, *100 Hz* and *200 Hz*. The default value is *100 Hz*.

Treble

- Using the slide control *Treble Boost* you can boost the treble in the range of *0 and 12 dBu*. The default value is *0 dBu*.
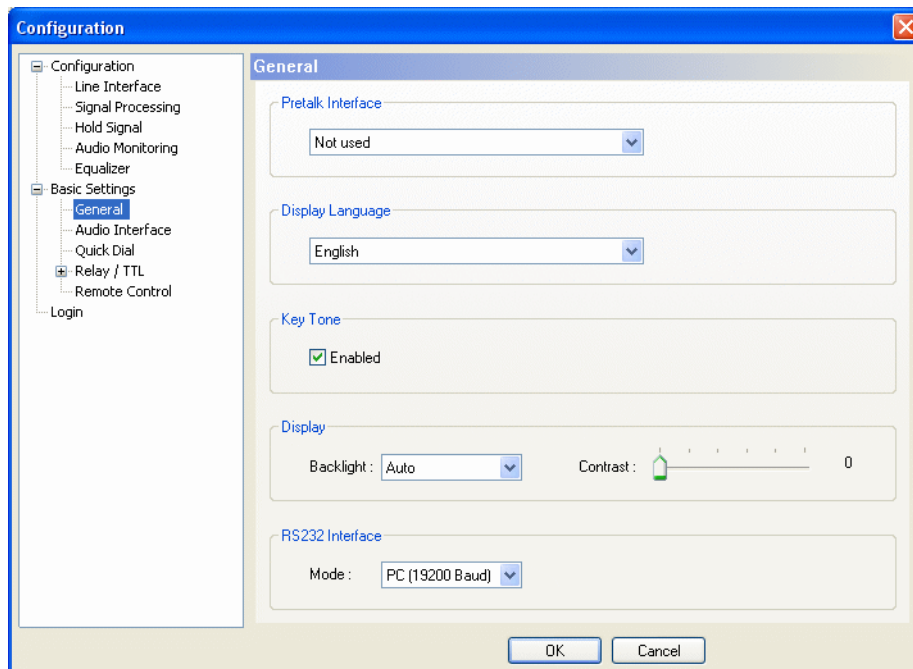
| 5.6.1.2 | **Basic Settings** |

| **NOTICE** | All configurations made under **Basic Settings** can**not** be saved as **Preset** ((see CHAPTER 5.6.2). |

| 5.6.1.2.1 | **General** |

FIG. 20   **GENERAL**

Pretalk Interface

- If you want to use the **PRETALK** function of the system, you must indicate under **Pretalk Interface** if a **Handset/Headset** or an analogue telephone (**External Phone (Only in POTS mode)** is connected.

| **NOTICE** | Please notice that an analogue telephone can only be used in the POTS operating mode. |

If you do not want to use the **Pretalk** interface, please select **Not used**.

Display Language

- Currently **English** and **Deutsch** are available as display languages.

Key Tone

- To activate the key tone, check the **Enabled** box.

Display

- The **Display** has a backlight. Under the setting **Backlight** you can switch it **ON** permanently. If you select the option **Auto** the backlight is turned off automatically **60** seconds after the last keystroke. The backlight is activated again by pressing any key (e.g. Ok).

NOTICE　　Please notice that if the keypad lock is activated, the backlight is only switched on again by pressing the key sequence Menu * .

- Via the slide control **Contrast** you can adjust the contrast in the range **0 ... 15** for the display. The default setting is **0**.

RS232 Interface

- If you want to operate the system with the PC or the **MAGIC TH2 Keypad**, you must set the data rate in accordance with the interface. There are three baud rates available: **Keypad (9600 Baud)**, **PC (19200 Baud)** and **PC (38400 Baud)**.

NOTICE　　The **MAGIC TH2 Keypad** supports only the baud rate 9600 Baud. Therefore, please select the option **Keypad (9600 Baud)** if you use a keypad. Of course, you can also select this baud rate if a PC is used.

If you connect a PC via the RS232 interface, the selected baud rate must correspond with the baud rate of the COM interface ((see CHAPTER 5.6.3).

5.6.1.2.2   Audio Interface

MAGIC TH2 supports analogue as well as digital AES/EBU Audio interfaces. If the digital interfaces are used, a separate Sample Rate Converter is available for the input and the output so that external adjustments are not required if there are different digital sources and drains.

FIG. 21   AUDIO INTERFACE
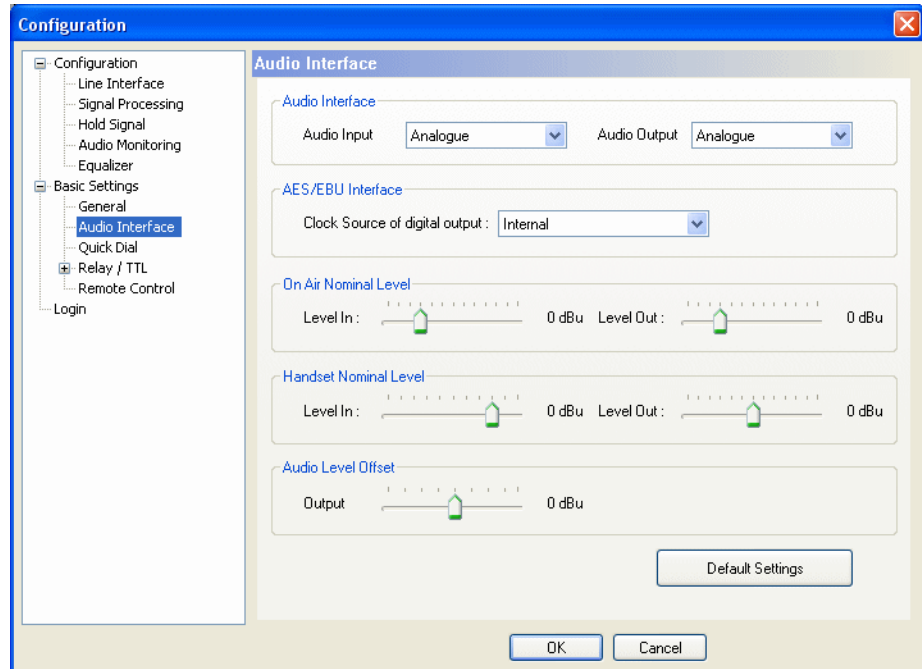
Audio Interface

• The operating mode *analogue* or *digital* can be set separately for the *Audio Input* and the *Audio Output*.

• If the output is set *digital*, additionally the configuration for the *AES/EBU Interface* is displayed. Under *Clock Source of digital output* you can select the following options:

   – *Internal*: The AES/EBU output clock is derived from the internal system clock.

   – *External*: The AES/EBU output clock is derived by the external clock connected via the interface *Audio 2/CLK IN*. The clock rate of the connected clock must be 48-kHz.

   – *Recovered*: The AES/EBU output clock is derived from the digital input signal of the interface *Audio 1/AES IN*. This configuration is usually to be selected if you use the digital input of the system. In this way a synchronous functioning of the transmission chain is ensured

NOTICE   The AES/EBU input always works with recovered clock, therefore a configuration of the output is required.
For clock synchronisation to other systems you can use the Audio output *Audio 2/CLK OUT*. The clock rate of the output clock is 48-kHz.

• If you operate the input or the output in an analogue mode, the corresponding slide control for adjusting the nominal Audio level of the *ON AIR* interface (*ON AIR Nominal Level*) is displayed. The nominal level

can be adjusted separately for the input (**Level In**) and for the output
(**Level Out**) in the range of **-3 ... +9 dBu** in 1-dB steps. The head room is **6
dB** in general. If you want to have the maximum level of 15 dBu for the sys-
tem, you must set 9 dBu as nominal level. The default settings are 0 dBu.

- If you configured the **PRETALK** interface for a **Handset/Headset** (see
  Page 52, Pretalk Interface), two slide controls for the Audio level adjust-
  ment are displayed. Under **Handset Nominal Level** you can set the Audio
  level separately for the input (**Level In**) in the range of **-24 ... +6 dBu** and
  for the output (**Level Out**) in the range of **-6 ... +6 dBu** in 1-dB steps. The
  defaults settings are 0 dBu.

- Via the slide control **Audio Level Offset** it is possible to increase or de-
  crease digitally the caller signal level in a range from **-16 ... +15 dB**.

HINWEIS   Please change this setting only if you have problems with your level adapta-
tion

- To set all parameters to default values press the **Default Settings** button.

5.6.1.2.3 Quick Dial

Up to 10 Quick Dial keys **QD0... QD9** can be programmed in the system. The Quick Dial keys are displayed in the middle part of the main window (see Fig. 8).

FIG. 22   QUICK DIAL
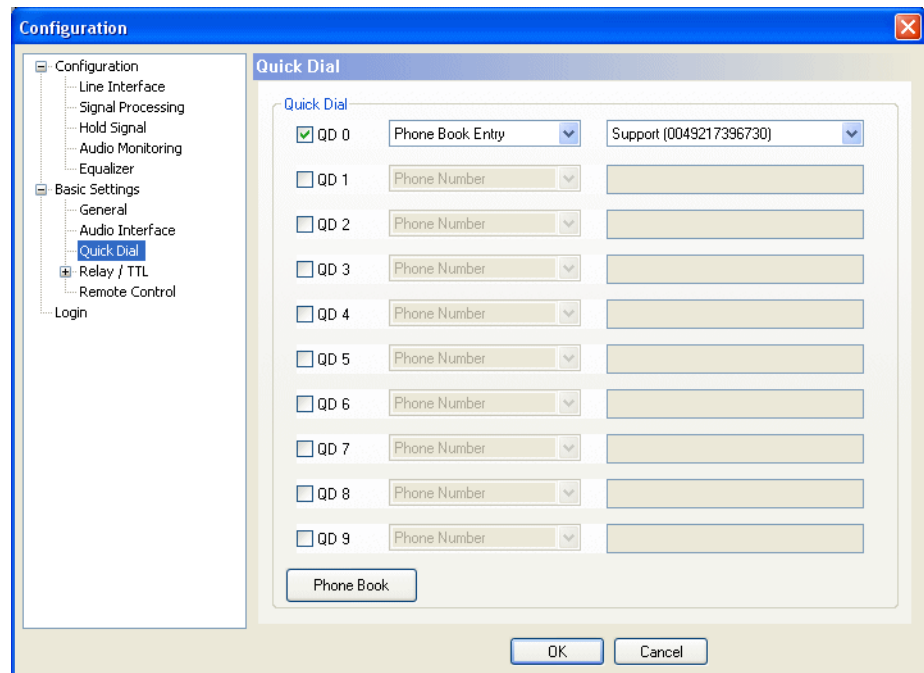
Please check the corresponding box to activate a quick dial.

If you want to program a number, select the option **Phone Number** and enter the phone number in the right field. A possibly required prefix number must not be added if you have already configured it (see Page 42, Prefix number).

Alternatively, you can select an entry directly from the phone book. Select the option **Phone Book Entry**. In the right field the list of all available phone book entries is displayed.

Via the button **Phone Book** you can directly open the phone book in which you can edit, delete or create new entries (see CHAPTER 5.4.1.7).

5.6.1.2.4   **Relay / TTL**

The **MAGIC TH2** system incorporates three **GPIO** Pins (TTL) which can be programmed separately as input or output. Additionally, two **Relays** are available.

The operating mode of a TTL-Pin - **Input** or **Output** is selected via the option **Direction**.

The following specification accounts for all three configuration windows **TTL1**, **TTL2** and **TTL3**.

TTL-Pin as input

FIG. 23   TTL-PIN AS INPUT
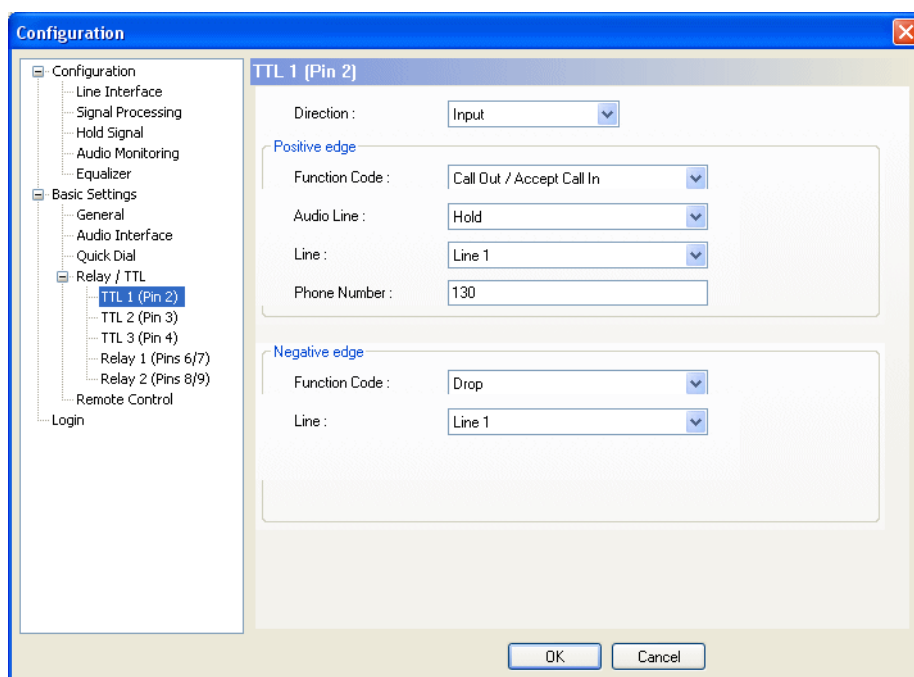
If you use a TTL-Pin as **Input**, you can program two different functions separately when edges change:

- **Positive edge**: The event is activated when the voltage on the TTL-Pin changes from 0V to+5V.

- **Negative edge**: The event is activated when the voltage on the TTL-Pin changes from +5V to 0V.

The following functions can be configured (**Function Code**):

– **Idle**: No function, the Pin is not used.

– **Call Out/Accept Call In**:
Via this function you can establish a connection to a certain **Phone Number**. Under **Line** you select the line (**Line 1** or **Line 2**) on which the connection is established (only in the ISDN operating mode). Under **Audio Line** you select the Audio line (**PRETALK**, **HOLD** or **ON AIR**) which is activated when the partner accepts the call.

– **Drop**: If you activate this function, a connection on the selected line (**Line 1** or **Line 2**) can be dropped.

– **Load Preset**: Via this function it is possible to load a preset which you have to select under **Preset**.

– **Set Audio Line**: This option allows a switching on a certain Audio line (**PRETALK**, **HOLD** or **ON AIR**), which you must set under **Audio Line**. In the **ISDN** operating mode you must additionally select the desired **Line**.

– **Connect via DTMF/Accept Call In**: The system supports the connection via DTMF tones (Option, see CHAPTER 8), which are fed in via the inputs **AUDIO 1 IN/AUDIO2 IN**. The call initiation is realised by this function so that the systems knows when the phone number is complete. Under **Line** you set the line (**Line 1** or **Line 2**) on which the connection is established (only in **ISDN** operating mode). Under **Audio Line** you select the Audio line (**PRETALK**, **HOLD** or **ON AIR**) which is activated when the partner accepts the call.
If the system receives a call, it can be accepted on the selected line via this function. The Audio interface is activated according to the configuration.

– **Connect Level Triggered** : After selection this funtion the call initiation is realised by a static level (**+5V** = configuration under **Positive Edge** or **0V** = configuration under **Negative Edge**) instead of a edge triggered level (see above).

Example 1:

You want to accept a call on line 1 with TTL 1. The caller is to be switched directly in the **ON AIR** mode. After the conversation has been finished the connection is to be cleared with TTL 1.

Programming:

Positive egde:

Function Code: Call Out/Accept Call In
Audio Line: ON AIR
Line: Line 1
Phone Number: -

Negative egde:

Function Code: Drop
Line: Line 1

FIG. 24   **SEQUENCE OF EVENTS FOR THE EXAMPLE 1**

Switch

Switch is opened:
Pin 2 = TTL 1 is on +5 V (via internal 10 KOhm series resistance)

Switch is closed:
Pin 2 =TTL 1 is set to 0V (Pin 5):
Existing connection is dropped

Switch is opened:
Pin 2 =TTL 1 is set to +5V:
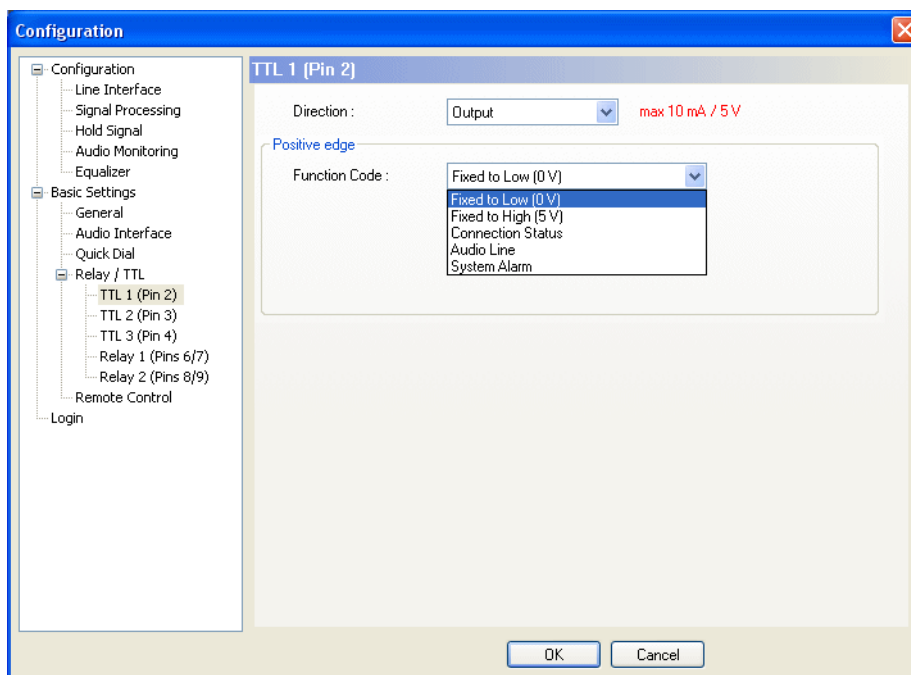Incoming call is accepted.

9-pol. SUB-D connector
to MAGIC TH2
(TTL/RELAY)

TTL-Pin as Output

Please pay attention to the maximum switch current of 10 mA respectively the maximum switch voltage of 5V per TTL output.

FIG. 25   **TTL-PIN AS OUTPUT**

If a TTL-Pin is configured as *Output*, the event is signalised as change of voltage on the TTL-Pin from 0V to+5V.

Under *Positive edge* you can select one of the following *Function Codes*:

– *Fixed to Low (0V)*: The TTL-Pin is set to 0V permanently.

– *Fixed to High (5V)*: The TTL-Pin is set to +5V permanently.

– *Connection Status*: Via this function you can signalise the connection status of a line. Select the connection status under *Status*. The following configurations are possible:

  – *Disconnect*

  – *Calling*

  – *Incoming call*

  – *Connect*

Under *Line* (only in the *ISDN* operating mode) you select the line whose status you want to signalise. In addition to *Line 1* and *Line 2* you can monitor the connection status of both lines if you select the option *All Lines*. As soon as one of the two lines meets the criteria, the signal is set on the TTL-Pin.

– **Audio Line**: Via this function you can signalise the currently selected Audio line. Please select under Audio line the desired Audio line **PRETALK**, **HOLD** or **ON AIR**.

Under **Line** (only in the **ISDN** operating mode) you select the line whose status you want to signalise. In addition to **Line 1** and **Line 2** you can monitor the Audio status of both lines if you select the option **All Lines**. As soon as one of the two lines meets the criteria, the signal is set on the TTL-Pin.

– **System Alarm**: If one of the possible system errors ((see CHAPTER 5.8.2) occurs, it can be signalised by selecting this option.

Relay

ATTENTION Please pay attention to the maximum switch current of 200 mA respectively the maximum switch voltage of 48V per relay output.

The following description applies for both configuration windows **Relay 1** and **Relay 2**.

FIG. 26   RELAY
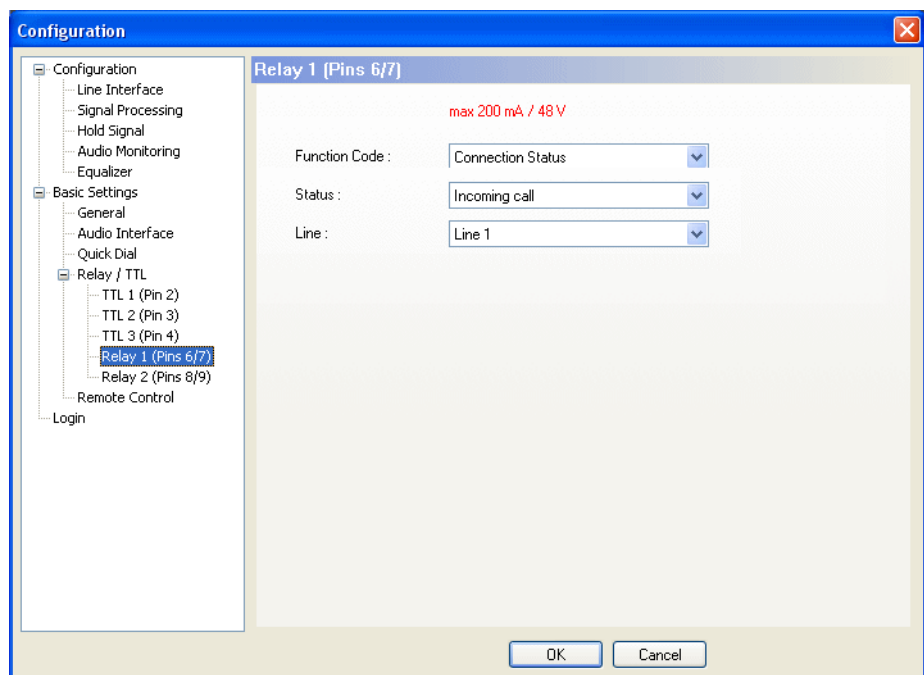
The options for the relay configuration are identical with the configuration of a TTL-Pin. The following **Function Codes** are available:

– **Always open** : The relay contacts are always open.

– **Always closed** : The relay contacts are always closed.

– **Connection Status** : With the use of this function you can signalise the connection status of a line. Select the connection status under **Status**. The following configurations are possible:

- – *Disconnect*

- – *Calling*

- – *Incoming call*

- – *Connect*

Under *Line* (only in the *ISDN* operating mode) you select the line whose status you want to signalise. In addition to *Line 1* and *Line 2* you can monitor the connection status of both lines if you select the option *All Lines*. As soon as one of the two lines meets the criteria, the relay is closed.

– *Audio Line* : Via this function you can signalise the currently selected Audio line. Please select under Audio line the desired Audio line *PRETALK*, *HOLD* or *ON AIR*.

– Under *Line* (only in the *ISDN* operating mode) you select the line whose status you want to signalise. In addition to *Line 1* and *Line 2* you can monitor the Audio status of both lines if you select the option *All Lines*. As soon as one of the two lines meets the criteria, the relay is closed.

– *System Alarm*: If one of the possible system errors ((see CHAPTER 5.8.2) occurs, it can be signalised by selecting this option.

5.6.1.2.5 Remote Control

The **MAGIC TH2 Remote Control Software** is available as optional software ((see CHAPTER 7). Via this software you can access the **MAGIC TH2** System with the help of any PC with an integrated ISDN card. The Software option is protected by an USB Dongle. A highlight is the integrated **ISDN S_0 Monitor**, which allows a detailed analysis of the D channel. For details please see CHAPTER 7, Page 89.

NOTICE   The function **Remote Control** is only possible in the operating modes **ISDN** and **ISDN Single Hybrid**.

FIG. 27   **REMOTE CONTROL**
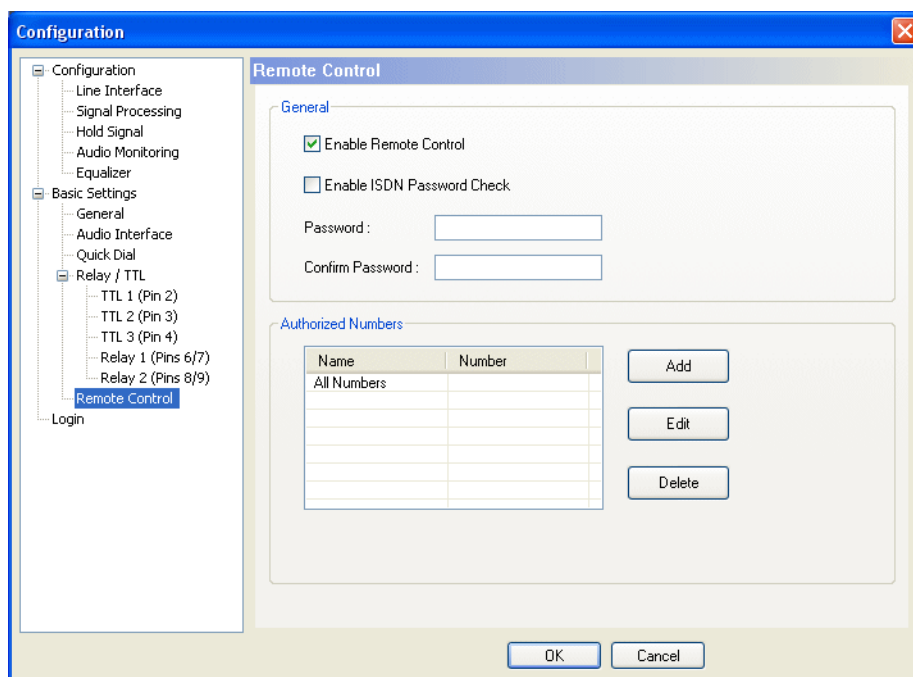
- Under **General** you allow a remote control of your system by checking the box **Enable Remote Control**. A **Password** protects your system from un-authorised access.

NOTICE   There is no differentiation between upper and lower case for the password entry.

The password check can also be carried out in the D channel of the ISDN which provides that the caller is not charged if he uses a wrong password. This function is activated via **Enable ISDN Password Check**. Please no-tice that this option is not supported by all ISDN lines[1].

- In the table **Authorized Numbers** you can set the telephone numbers from which a remote control is possible. There are maximum **six** entries availa-ble. The systems checks the incoming telephone number beginning with the last numeral, i.e. the area code usually does not have to be entered. The **CLIP (= Calling Line Identification Presentation)** function of the re-mote station must be enabled for this function. The check is already carried out via the D channel protocol. If the caller is not in the list, he is rejected by the system immediately. In this case, there are no costs for the caller.

---

[1] The ISDN feature **Sub addressing** is used for this.

Via the **Add** button you can enter a new telephone number with corresponding name. With the **Edit** button it is possible to edit the currently selected entry and if you press **Delete** the entry is deleted.

FIG. 28	EXAMPLES FOR ENTRIES UNDER AUTHORISED NUMBERS

Name	Number	
AVT Support	09115271160	
Mueller	123456	

NOTICE   If all entries are deleted, the entry **All Numbers** is displayed automatically and any subscriber can call the system. In this case you should use a password at any rate.

5.6.1.3 Login

To protect the system from re-configurations, two password levels with different user rights are available.

ATTENTION

⚠

The entered password is saved in the system. It is highly important that you enter your password carefully. If you have forgotten your password, only the AVT Service can re-activate the system.

- Under **USER** you assign the user **Password**. For safety reasons you must confirm the password under **Confirm Password**.

- Under **ADMINISTRATOR** you assign the Administrator **Password**. For safety reasons you must confirm the password under **Confirm Password**.

NOTICE

There is no differentiation between upper and lower case for the password entry.

FIG. 29 LOGIN

When you have assigned a password, the window for the password entry is automatically displayed when you click on a menu with password protection. Please enter the User Password or the Administrator Password.

FIG. 30 PASSWORD LOGIN

The authorisation levels are defined as follows:

(1) Only **Administrator Password** is configured: The password must be entered for configuration changes. Immediately available menus:

- *Configuration → Presets → „Configuration Name"*

- *Extras → Center Window*

- *Extras → System Monitor*

(2) Only **User Password** is configured: The password must always be entered. Afterwards all menus are available. Immediately available menus:

- *Extras → Center Window*

- *Extras → System Monitor*

(3) **User Password** and **Administrator Password** are configured: The password must always be entered.

- **User Password** is entered:

    Under *Configuration → Configuration → Login* the *USER* password can now be changed.

    Via *Configuration → Presets* the desired configuration can be loaded.

    Immediately available menus: *Extras → Center Window* and *Extras → System Monitor*

- **Administrator Password** is entered: All menus are available.

NOTICE   Please pay attention to the configuration options of the system if a password is assigned (see CHAPTER A1).

5.6.2   Submenu Presets

Via **Presets** you can load already created configurations.

5.6.2.1   Manage Presets

Your created **Presets** can be managed via the menu **Configuration → Presets → Manage Presets**.

FIG. 31   MANAGE PRESETS
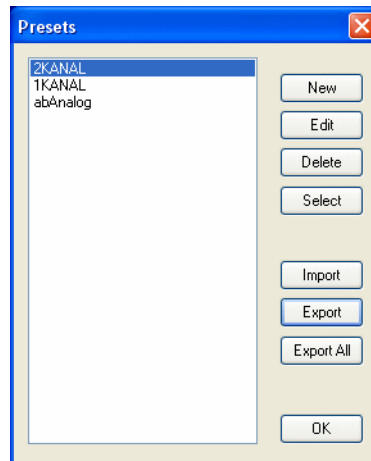
All already existing configurations are displayed in the list.

• With the use of the **New** button you create a new configuration. The current configuration of the system is not changed or loaded by this function. First, select an expedient name. The length of the name must not surpass 8 characters. Special characters and space characters are **not** allowed. Please mind that you use unique names.

FIG. 32   NEW CONFIGURATION
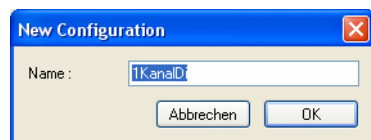
Subsequently, the configuration dialogue is opened for the editing of the **Presets**. The current configuration is always displayed as basis of a **Preset** which you can adjust according to your wishes. The following configurations can be saved as Preset:

– Line Interface (see Page 41)

– Signal Processing (see Page 44)

– HOLD Signal (see Page 47)

– Audio Monitoring (see Page 49)

– Equalizer (see Page 51)

FIG. 33   **EDIT PRESET**
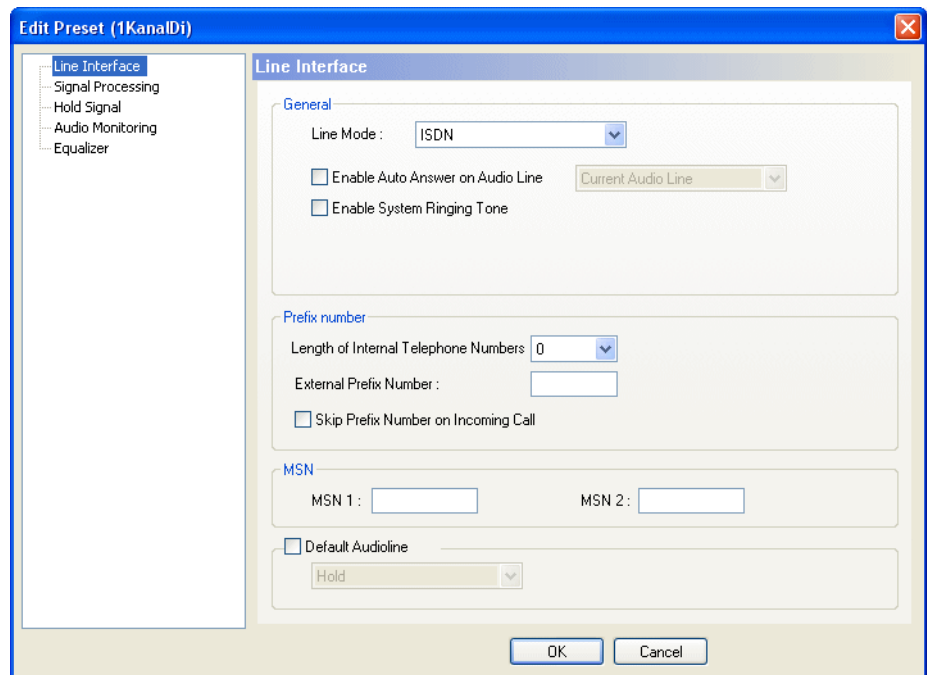
- By using the button *Edit* the currently selected configuration can be edited. The current configuration of the system is not changed or loaded with this function.

- Via the button *Delete* the configuration selected from the list is deleted. For safety reasons you have to confirm your selection.

FIG. 34   **CONFIRMATION DELETE PRESET**
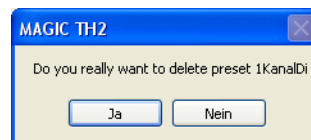
- To activate a configuration selected from the list, press the *Select* button. For safety reasons you have to confirm your selection.

FIG. 35   **CONFIRMATION LOAD PRESET**
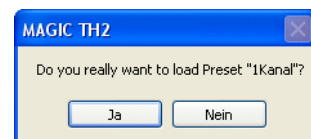
- Via the button *Import* a configuration can be imported from a data carrier (disk, USB stick etc.). The file extension of the configuration file is always '*.thp*'. A click on the button opens the file browser in which the desired file can be selected.

- Likewise, it is possible to export configurations to a data carrier. The button *Export* saves the configuration selected from the list as '*.thp*' file. By clicking on the button the file browser is opened and you can choose the location where the file is saved.

With **Export All** all configurations displayed in the list are saved in a directory of your choice. A separate data file with the file extension '*.thp*' is generated for each configuration.

TIP

If you need to configure several systems in the same way, set up one system first and export all configurations to a disk. To configure all further systems easily, import the configurations from the disk.

This is also possible for the phone book and the **HOLD** signal. Via the **Import/Export** function under **Administration** (see CHAPTER 5.8.3) you can comfortably save all information and load on other systems.

5.6.2.2   **Activation of a Preset**

All Presets are displayed under **Configuration** → **Presets** → **„Preset Name"** and can be activated with a click.

FIG. 36   LOAD PRESET
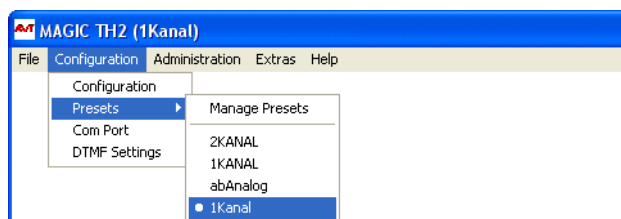
For safety reasons a confirmation is required.

FIG. 37   CONFIRMATION LOAD PRESET
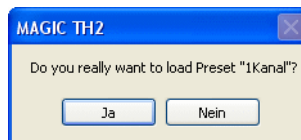
5.6.3   Submenu COM Port

The system is connected via the serial RS232 interface with a 1:1 connecting cable to a PC or to the *MAGIC TH2 Keypad*. The configuration of the COM Port of the PC can be carried out under *Configuration → COM Port*.

FIG. 38   **RS232 PARAMETER OF THE COM PORT**
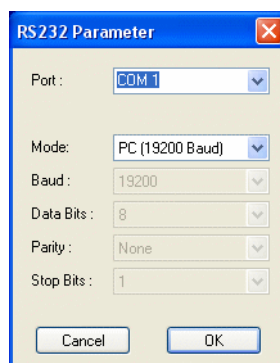
As *Port* you select the interface of your PC which is connected to the *MAGIC TH2*.

Under *Mode* you can set the desired operating mode:

– *Keypad (9600 Baud)*: To connect the keypad or a PC

– *PC (19200 Baud)*: To connect a PC

– *PC (38400 Baud)*: To connect a PC

NOTICE   The *MAGIC TH2 Keypad* supports only a baud rate of 9600 Baud. Therefore, if you use a keypad, always select the option *Keypad (9600 Baud)*. Of course, this baud rate can also be selected when a PC is used.

If a PC is connected via the RS232 interface, the selected baud rate must correspond with the baud rate of the COM interface (see also Configuration of the RS232 Interface, Page 53).

All further parameters like *Data Bits*, *Parity* and *Stop Bits* cannot be configured.

5.6.4   Submenu DTMF Settings (Option)

The menu **DTMF Settings** is only displayed if the fee-based option **DTMF** is activated. Further details you will find in CHAPTER 8, Page 95.

5.7   **Menu Administration**

FIG. 39   **MENU ADMINISTRATION**
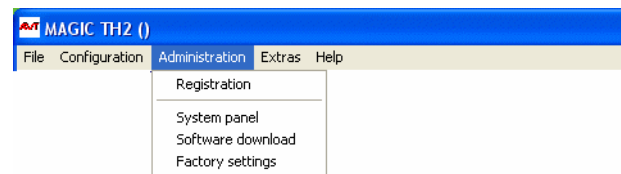
5.7.1   **Submenu Registration**

The data concerning production as well as the enabled options can be displayed under the submenu *Registration*.

FIG. 40   **SUBMENU REGISTRATION**

This number
is required
to enable
software options
supplementarily
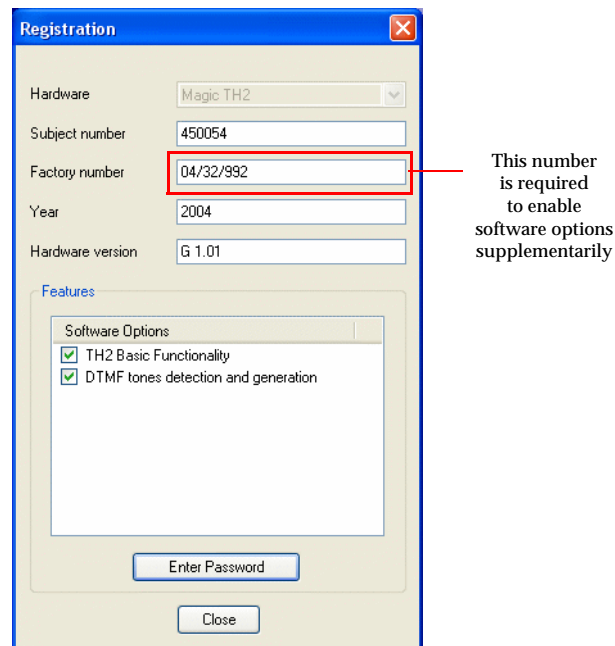
The data of the unit include the following information:

– *Hardware*

–   *Subject Number*

– *Factory Number*

–   *Year* of production

–   *Hardware Version*

• Under *Features* the available and activated *Software Options* of the
   MAGIC TH2 are displayed. Deactivated options can be activated via a
   password. This password is assigned according to the Factory *Number*. If
   you bought an option supplementarily, please enter the password that you
   received from us under *Enter Password*.

FIG. 41   **PASSWORD ENTRY TO ENABLE AN OPTION**
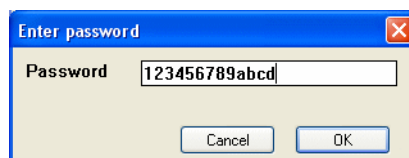
Subsequently, the system executes a warm start. Afterwards, the functions are activated.

ATTENTION Please enter the password carefully.

If you enter a wrong password **three times**, you must switch off the system and switch it on again.

5.7.2   **Submenu System Panel**

The *System Panel* is only for service purposes. Please enter only commands in the prompt, if our Support requested it from you.

FIG. 42   **SUBMENU SYSTEM PANEL**

System Panel

```
Config saved: R:CFGBASE.CFS
Password error!
Password error!
Password error!Booting system...
Config loaded: A:STARTUP.CFD
Load HOLD signal...
HOLD signal loaded
Booting ended
Config saved: R:CFGBASE.CFS
L1 activated: 000000
```

Send   Close
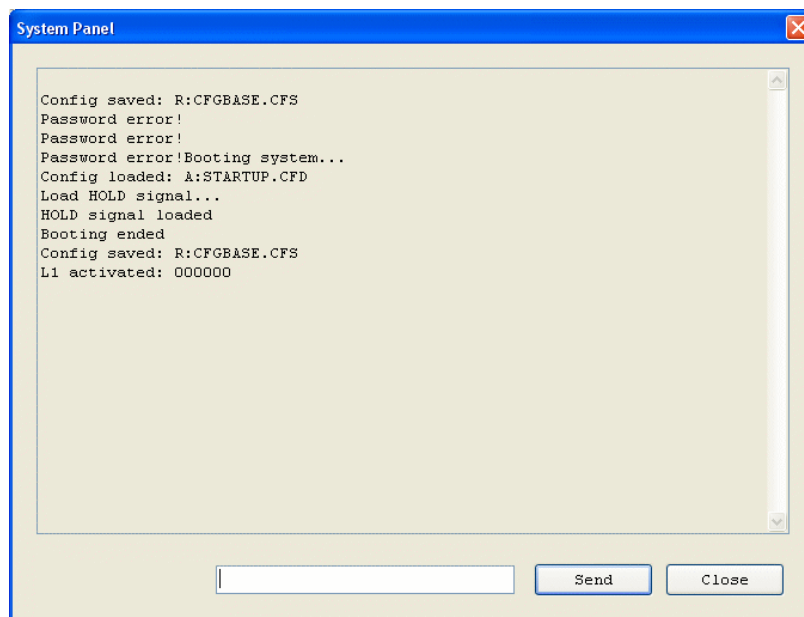
5.7.3   Submenu Software Download

The required firmware for the *MAGIC TH2* system is always included in the PC software: Via the **Software Download** you can comfortably download the firmware on your system.

By using the **Browse** button you select the firmware file. It is always located in the same directory in which you installed the *MAGIC TH2* application. The standard installation directory is:

C:\Program Files\MAGIC TH2

The file name of the firmware is „*th2.ssw*".

FIG. 43   SUBMENU SOFTWARE DOWNLOAD
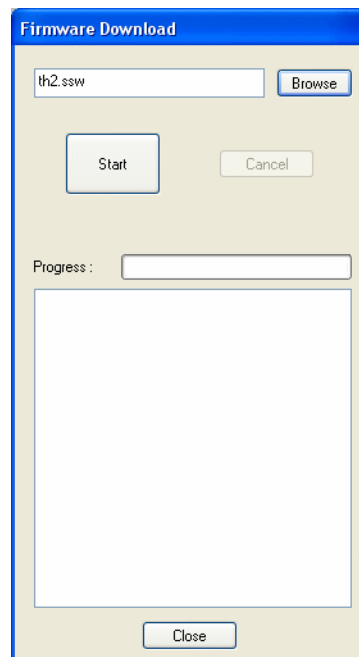
Please press the **Start** button to download the firmware. The **Progress** bar displays the progress of the download. The process is finished after about three minutes. If the download was successful, a corresponding message is displayed. After your confirmation the system is reset.

NOTICE   If the download was not successful, you can simply switch off the unit and switch it on again. The new software is only written in the flash memory if the download was successful. Otherwise the old firmware is maintained.

5.7.4   **Submenu Factory Settings**

By using the submenu *Factory Settings* the system can be reset to the initial state.

For safety reasons you have to confirm your selection.

FIG. 44   **CONFIRMATION LOAD FACTORY SETTINGS**
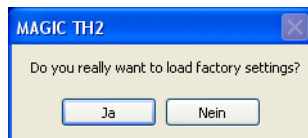
5.8   **Menu Extras**

FIG. 45   **MENU EXTRAS**
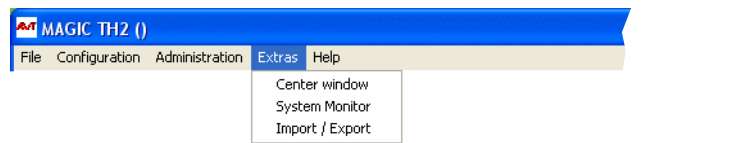
5.8.1   **Submenu Center Window**

Via *Center Window* the main window can be centred on your screen.

5.8.2   **Submenu System Monitor**

Via the menu *System Monitor* you receive information about the system status.

FIG. 46   **SUBMENU SYSTEM MONITOR**
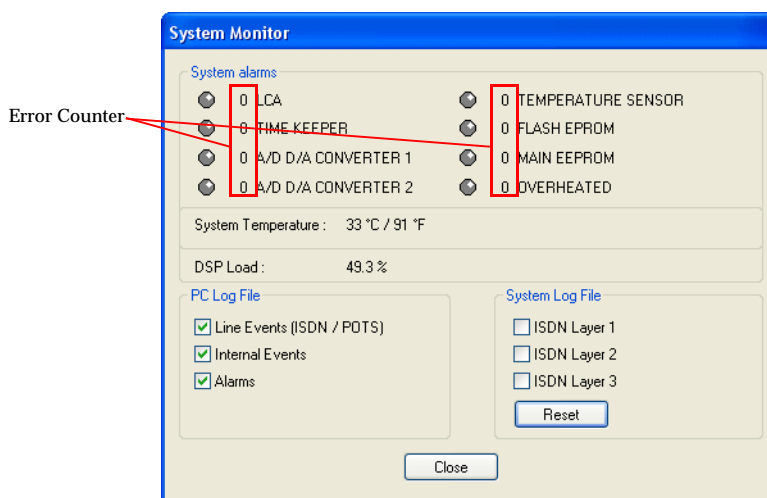
- Under *System alarms* all potential alarms are displayed. A red LED signalises a currently existing alarm. How often the error occurred since switching on is displayed by the corresponding error counter.

NOTICE   If an alarm occurs frequently or over a longer period disconnect the unit from electricity. If the error occurs again after switching on, there is probably a hardware defect.

The following errors are signalised:

– *LCA*: The communication with a programmable component is faulty.

– *TIME KEEPER*: The communication with the integrated clock module is faulty.

– *A/D D/A CONVERTER 1*: The communication with the first ADDA converter is faulty.

– *A/D D/A CONVERTER 2*: The communication with the second ADDA converter is faulty.

– *TEMPERATURE SENSOR*: The communication with the temperature sensor is faulty.

– *FLASH EPROM*: The communication with the permanent memory is faulty. Configurations cannot be saved or read anymore.

– *MAIN EEPROM*: The communication with the permanent memory is faulty. Configurations cannot be saved or read anymore.

– *OVERHEATED*: The system sets this alarm if the system temperature is higher than 57°C. Disconnect the unit from electricity or cool down the ambient temperature.

TIP   A system alarm can also be configured as relay output (see Page 57).

The actual system temperature is displayed in °C and °Fahrenheit under *System Temperature*. The regular system temperature ranges from 30...40°C ⁄ 86...104°F.

Under **DSP Load** the load of the system is displayed. The usual load is about 55 to 65%.

• Via the function **PC Logfile** you can record major events of the system. Every day a new file is created according to the following scheme

yyyy-mm-dd.txt   (z.B. 2004-12-23.txt)

The files are located in the installation directory in the folder

Logfiles

You can read the files with any text editor.

The log file is created by the PC software. If the PC software does not run, the logging is not continued.

The following events can be activated:

– **Line Events (ISDN/POTS)**: All line events (link connection and disconnection) are recorded.

– **Internal Events**: All internal events are recorded in the log file (e.g. RS232 connecting error).

– **Alarms**: All alarms are recorded.

FIG. 47   **EXAMPLE LOG FILE**
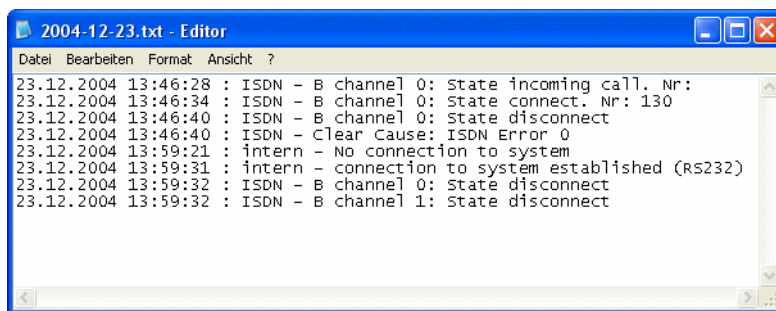
• Under **System Logfile** you can create a detailed ISDN log file.

– **ISDN Layer 1**: Physical Layer: All messages concerning the physical activation/deactivation of the ISDN interface are stored in this layer.

– **ISDN Layer 2**: Data Link Layer: The main task of the data link layer is to take a raw transmission facility and transform it into a line that appears free of transmission errors in the network layer. This layer should only be activated for the log file if there are potential problems. Please notice that if this layer is enabled an entry is generated every 8 seconds and therefore the memory is filled quickly.

– **ISDN Layer 3**: Network Layer: The Network Layer enables that a connection between two subscribers is established by adequate addressing. This layer is the most important one for the logging since all connection data is recorded here.

The system saves all messages of the activated **ISDN Layer**. The internal memory capacity is 128-kByte[1]. The data is filed cyclically.

---

[1] An entry in the ISDN protocol is about 15 Byte on average.

– To delete all system ISDN log files press the **Reset** button. To avoid un-intentional deleting, you have to confirm that you really want to delete the entry with **Yes**.

NOTICE   Data can be analysed via the option **ISDN S$_0$ Monitor** (see CHAPTER 7.2, Page 92). Our Support can also read these data via remote access. If you experience problems with your ISDN connection, please activate the desired ISDN layer of the system log file so that we can analyse it.

5.8.3 Submenu Import/Export

Via the *Import/Export* function you can import or export the **Phone Book**, the **Recorded Hold Signal** and the **S0 Monitor File** from a data carrier (e.g. disk, USB stick) to the system (not S0 Monitor File) or from the system to a data carrier.

FIG. 48 SUBMENU IMPORT/EXPORT
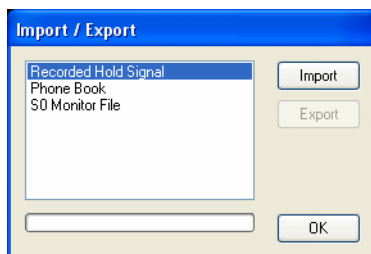
Select the desired function from the list and press the *Import* button respectively the *Export* button.

Used formats:

– The phone book is saved as *CSV* file. This format can be opened with any text editor or edited with MS EXCEL.

 Example:

```
Phonebook FileVersion:;1
Name;Number
Wolfgang;130
Andreas;131
Peter;201
Robert;200
```

 Please note: The first two lines form the header and must not be missing.

– The recorded *HOLD* signal is saved as *WAV* file. It can be recorded or played using for instance the Audio recorder in Windows XP (Accessories → Entertainment). The *WAV* file must correspond with the following specifications:

 – Resolution: 16 Bit

 – Sampling frequency: 8-kHz

 – Mode: Mono

– The **S0 Monitor File** is saved as binary file and can be analysed via the optional **ISDN S$_0$ Monitor** (see CHAPTER 7.2, Page 92).

NOTICE Alternatively, you can send the file to our Support via email for analysis: *support@avt-nbg.de*

5.8.4　　　　**Submenu S0 Monitor (Option)**

The function **S0 Monitor** is only available, if the fee-based option **Remote Control Software** is enabled.

For further details concerning the functions of the SO Monitor see CHAPTER 7, Page 89.

5.9   Menu Help

FIG. 49   MENU HELP

5.9.1   Submenu About MAGIC TH2

In the **About MAGIC TH2** dialogue you find the software versions of the PC software (**PC Version**) and of the systems (**Firmware Version**). Besides, you can find our contact details there.

FIG. 50   SUBMENU ABOUT MAGIC TH2

6 OPTION: MAGIC TH2 KEYPAD

The optional *MAGIC TH2 Keypad* enables users, who do not use a PC to operate the hybrid and who do not want to use the front display, to operate the system in an easy and comfortable way.

NOTICE To use the keypad with the *MAGIC TH2*, you must set the parameters for the RS232 interface to 9600 Baud, no parity. If you use the *QuickMenu* function you reach the settings of the RS232 parameters directly via the key sequence Menu 1 5 . Please select Keypad 9600, none.

The following figure shows the operating elements of the Keypad.

FIG. 51   KEY ASSIGNMENT MAGIC TH2 KEYPAD
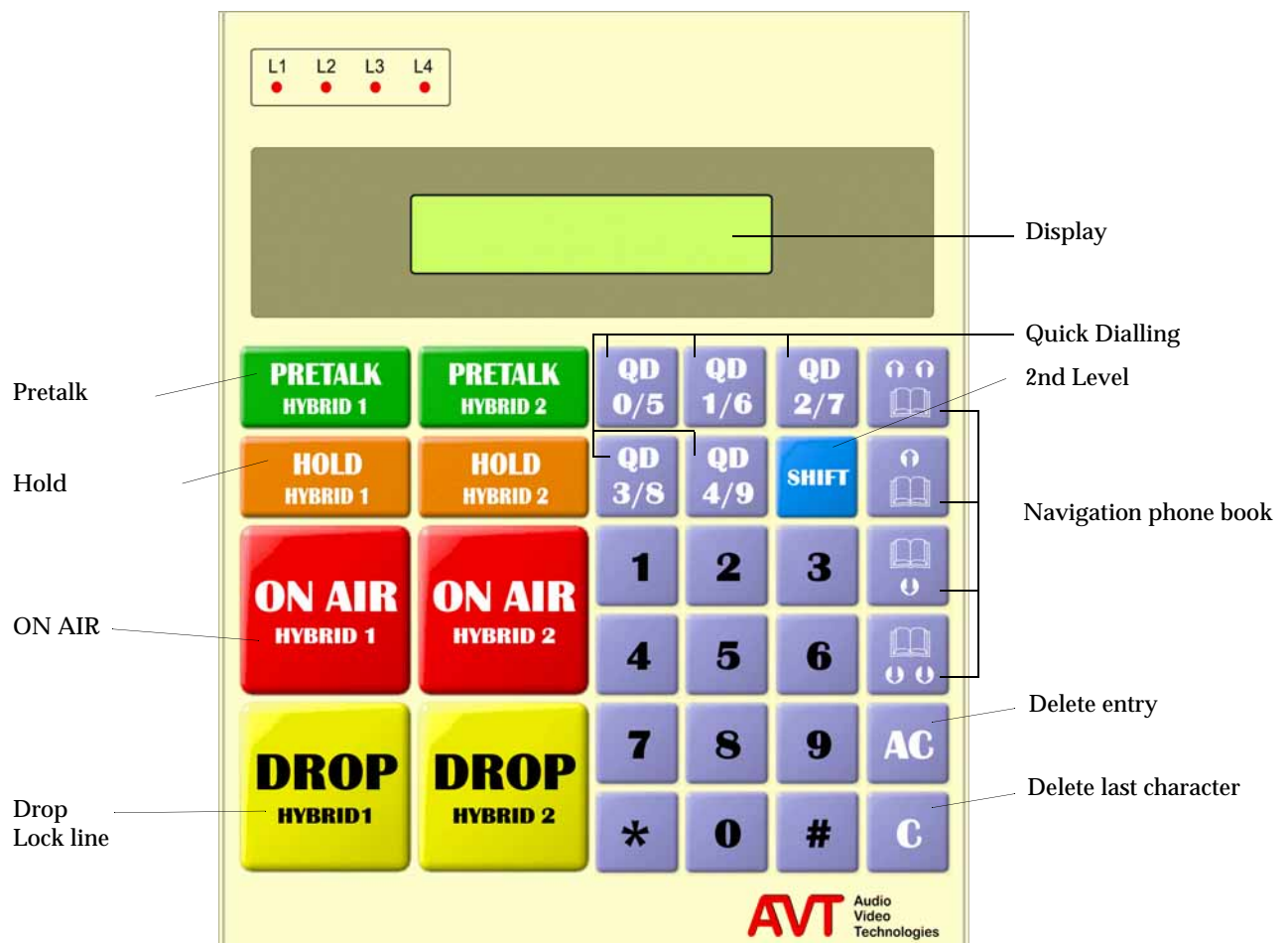
Please connect the 9-pole SUB-D connector of the *MAGIC TH2 Hybrid Keypad* with the *RS232* interface (see CHAPTER A3.2, Page 111) of the *MAGIC TH2* System. Since the *MAGIC TH2 Hybrid Keypad* requires its own power

supply, please plug in the external power supply included in delivery and connect the 6-pole Mini-DIN socket of the external power supply with the 6-pole Mini-DIN connector of the **MAGIC TH2 Hybrid Keypad**. If everything is connected correctly, the display is illuminated. After switching on[1] the system, the message you can see in our figures is displayed after booting.

```
1➔DISCON. 2➔DISCON.
INTERFACE: ISDN
```

If you use the ISDN operating mode, the status of channel 1 is displayed on the left side and the status of channel 2 is displayed on the right side.

```
1➔DISCONNECT
INTERFACE: POTS
```

In the POTS operating mode only channel 1 is displayed. The functions of the buttons PRETALK, HOLD, ON AIR and DROP for Hybrid 2 are deactivated.

6.1 LCD Display

The LCD Display with 2 x 20 characters generally displays information about the current connection status of the available channels in the first line. The following indications are possible:

TAB. 1   OVERVIEW OF THE STATUS INDICATIONS OF THE 1. DISPLAY LINE

Display	Meaning
CALLING	Outgoing call
🔔🔔🔔🔔🔔🔔🔔	Incoming call
DISCONNECT	No connection
ON AIR	Caller is in On Air mode
HOLD	Caller is in Hold mode
PRETALK	Caller is in Pre Talk mode
Locked	Line is locked

The second line changes according to the status of the function.

```
1➔DISCON. 2➔DISCON.
INTERFACE: ISDN
```

– If there is no connection, the selected operating mode ISDN or POTS (analogue) is displayed.

```
1➔CALLING 2➔DISCON.
03012345678
```

– If a telephone number is entered, the second line displays the telephone number
  The phone number can be entered with the keys 0...9.

NOTICE The cypher last entered can be deleted by pressing the C button.
The entire entry is deleted by pressing the AC button.

```
1➔ON AIR  2➔DISCON.
⬅■■  ➔■
```

– During a connection it is possible to display a level meter instead of the phone number respectively the name. To shift please press the short-cut SHIFT + 3. The Audio level of the incoming caller signal (⬅) as well as the outgoing signal to the caller (➔) is displayed.
  The level meter covers the range from -34...+6 dB in 2 dB steps.

---

[1] If the system has already been switched on, please press the button „C" or „AC" once.

– If there is a connection error, the ISDN provides various alarm messages. Please see the following table for their meanings. The LCD display shows the relevant B channel first followed by the alarm message.

TAB. 2	ISDN ALARM MESSAGES
Alarm message	**Description**
Unass. number	The number is not recognised by the ISDN. Please check your entry
No route	No route. When this message appears the ISDN is normally overloaded. Please dial again.
Normal disc.	The connection has been cleared.
User busy	The number called is busy.
No user resp.	The called number is not responding. Possibly the wrong number was dialled.
Call rejected	The call was rejected. Possibly the partner has rejected your call.
Number chang.	The dialled number has been changed.
Destin. error	The called end is not operational. Maybe the unit is switched off.
Inval. number	Invalid Number.
No line avai.	No B channel available.
No Network	No ISDN available. Check your ISDN line.
Netw. failure	Temporary ISDN failure.
Congestion	ISDN network error. Maybe the wrong ISDN protocol is selected.
Bearer capab.	The wanted service is not available.
Bearer serv.	The wanted service is not implemented.
Remote disc.	Connection has been dropped by the partner
Procedure er.	Remote or local ISDN procedure error.
Cannot dial	System cannot dial.

6.2   **Keypad Functions**

Below you will find the keypad functions listed in table form.

TAB. 3   KEYPAD FUNCTIONS

Function key	Description
C	After pressing the key the last cypher of an entry is deleted. Partly, this key is used to terminate an operation.
AC	By pressing this key you can delete the entire entry.
0 — **9**	Via the keys 0...9 it is possible to enter a phone number. The connection is established by pressing the button PRETALK, HOLD or ON AIR of the respective channel.
* **#**	The keys '*' and '#' are mostly used for special functions in connection with a private branch exchange.
QD 0/5 — **QD 4/9**	By pressing the Quick Dial keys QD 0 ... QD 4 a preprogrammed number is dialled immediately. The storage of the telephone number can be carried out via the PC Software (see CHAPTER , Page 34) or via the Keypad itself. The shift to the second level is carried out by the SHIFT key. Programming of a Quick Dial key: - Entering the phone number - Pressing SHIFT + 3 - Selecting the desired Quick Dial key
SHIFT	The SHIFT key allows a shifting to the 2. Quick Dial Keys level. If the SHIFT key is pressed the character '^' is displayed in the upper right corner. Additionally, the following special function are programmed: SHIFT + 1: Activating/Deactivating the sending of DTMF tones in channel 1[a] SHIFT + 2: Activating/Deactivating the sending of DTMF tones in channel 2 SHIFT + 3: Programming of the Quick Dial keys SHIFT + 4: not used SHIFT + 5: Display of the software version SHIFT + 6: Shift display of phone number (name)/ display of level meter
(headphones/book icons)	Via these two keys you can scroll 5 entries upwards respectively downwards in the phone book.
(headphone/book icons)	Via these two keys you can scroll 1 entry upwards respectively downwards in the phone book.
DROP HYBRID 1/2	This button drops the connection of the respective channel. There is no request for confirmation. If no connection exists the line can be locked by pressing the key. Now the status LOCKED is displayed. The line is unlocked by pressing the key a second time. This function is only available in the ISDN operating mode.

```
1➜DISCON. 2➜DISCON. ^
03012345678
```

TAB. 3   **KEYPAD FUNCTIONS**

Function key	Description
PRETALK HYBRID 1/2	The caller on the respective channel is set in the PRETALK mode. The PRETALK can be carried out via the handset or in the analogue POTS operating mode via a standard telephone. If a caller on the other channel is already in PRETALK, he is set automatically in HOLD mode.
HOLD HYBRID 1/2	The caller is set in the HOLD mode. The signal which the caller listens to in this status can be set via the PC Software (see CHAPTER , Page 34).
ON AIR HYBRID 1/2	The caller on the corresponding channel is set in the ON AIR mode. The caller signal can be heard on the corresponding Audio line Audio 1 / 2 OUT. There is no mixing of the two callers.

a   A * is displayed behind the channel number if the sending of DTMF tones is activated. To send DTMF tones, the fee-based option **DTMF** must be enabled.

```
1*DISCON. 2➜DISCON.^
03012345678
```

7   **OPTION: REMOTE CONTROL & ISDN MONITOR**

The fee-based *MAGIC TH2 Remote Control & ISDN Monitor Plug-In* enables you to access the *MAGIC TH2* System from a standard PC with integrated ISDN card. A local *MAGIC TH2* System is not required. The software option is protected by an USB Dongle. A special highlight is the integrated *ISDN S_0-Monitor* which makes a detailed analysis of the D channel possible - locally and via remote access.

7.1   **Remote control of a MAGIC TH2 System**

NOTICE   The Remote Control function is available in the operating modes *ISDN* and *ISDN One Channel Hybrid*. The USB Dongle included in delivery must be connected to your PC and an ISDN card must be installed.

The Remote Control function can be enabled via the menu *Administration → Remote Control*.

FIG. 52   **REMOTE CONTROL**
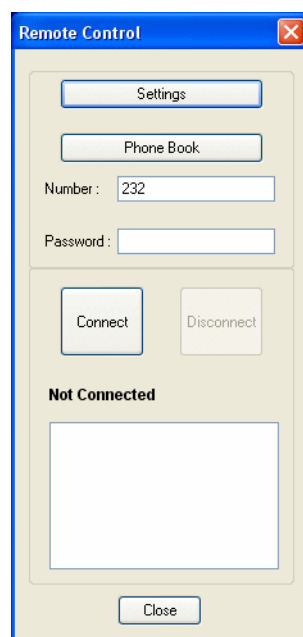
- Under *Settings* you can enter your own *MSN*. The MSN is only required if you operate several units via your ISDN Bus. However, some private branch exchanges always require the entry of a MSN.

FIG. 53   MSN CONFIGURATION FOR REMOTE CONTROL
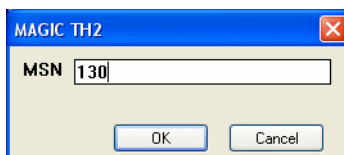
- Under **Number** you enter the telephone number of the remote system, which you want to operate by remote control, or you select an entry from the phone book by pressing the **Phone Book** button.

- If the remote station is protected by a remote password, you must enter this password under **Password** to get access the remote system (see CHAPTER 5.6.1.2.5).

ATTENTION If the access to the remote station is protected by authorised phone numbers, you must carry out the remote access exactly via the ISDN line whose number is entered in the list. The CLIP function must be enabled for that line.

- The connection to the remote station is established by pressing the button **Connect** and it is dropped via the button **Disconnect**. The connection status is displayed in the status window underneath. If the connection has been established successfully, the message **Remote control online** is displayed, like in the following figure.

FIG. 54   REMOTE CONTROL ONLINE
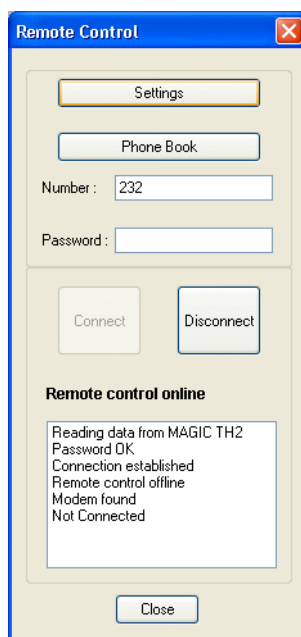
Now, the **MAGIC TH2** System can be operated and configured as usual. One of the two B channels is busy by the remote control so that there is only one channel available for the user. The remote station can also disconnect the remote control at any time.

The main window of the **MAGIC TH2** Software displays the existing connection under **Remote Management**. To stop the remote configuration press the key.

FIG. 55   **DISPLAY DURING REMOTE CONTROL**

Display of
Remote
Connection
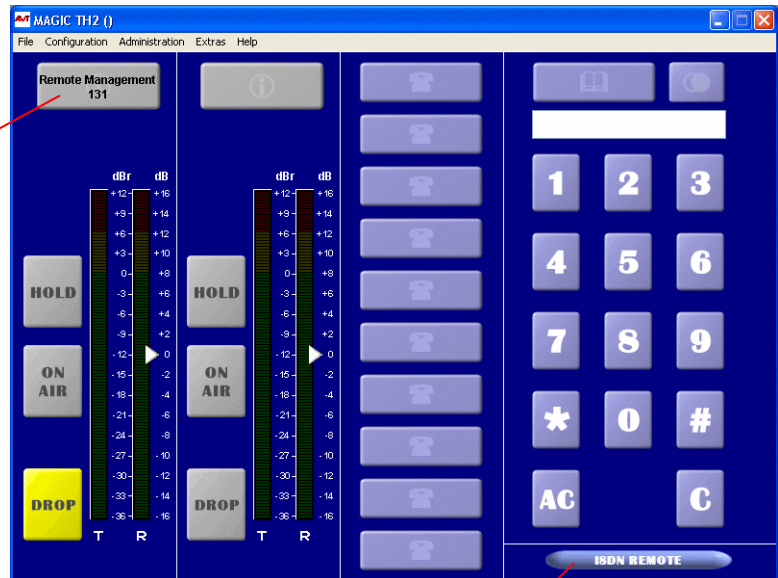
Connection status

NOTICE   For safety reasons the settings for *Remote Control* (see CHAPTER 5.6.1.2.5) and *Login* (see CHAPTER 5.6.1.3) are not visible for the remote station and cannot be changed.

7.2 **The integrated S$_0$ Monitor**

The integrated S$_0$ Monitor provides a detailed analysis of the D channel log file.

FIG. 56 S$_0$ MONITOR USER

- The analysis of the D channel log file can be carried out **Online** or via the **System Log File** (see CHAPTER 5.8.2, Page 77) which is stored in the system. The desired operating mode can be selected under **Navigation**. With **Stop** the current logging is stopped.

- **Display** shifts between the **User**, **Layer 2** and **Layer 3** display. The **User** option displays a summary of the most important information. For experts the options **Layer 2** and **Layer 3** are also informative.

- Errors in the log file are displayed red-shaded. Via the button **Go to Error** the display goes to the next error of the log file.

- The button **Reset** deletes the display window.

- Via the **Export** key the log file can be exported in the currently selected read-out as RTF (Rich Text Format). This file can be read with MS WORD for instance.

- Via the **Open** key you can open a saved log file (see CHAPTER 5.8.3, Page 80) and analyse it offline.

- By pressing the button **Save** the current logging is saved as binary file.

- In the line **HEX** the binary data of the currently selected row of the log file is displayed in hexadecimal form.

- Using **Filter** you can filter the log file for certain criteria. **S0** selects the ISDN interface of the system. For the **MAGIC TH2** this value must always be „**0**" respectively be empty, since the system incorporates only one ISDN interface.
  Using the filter **CR** (Call Reference) you can display all available entries for a transaction. Additionally, the colour in which the entries are displayed is changed for each new Call Reference.

FIG. 57   S$_0$ MONITOR LAYER 2

FIG. 58   S$_0$ MONITOR LAYER 3

8   OPTION: DTMF TONE GENERATOR & ANALYSER

With the fee-based option **DTMF[1] Tone Generator & Analyser Plug-In** you have the possibility to send DTMF tones on the one hand and to analyse DTMF tones on the other hand.

8.1   DTMF system functions

8.1.1   Sending DTMF tones via the front keypad

DTMF tones can be generated directly via the front keypad of the system by pressing the numeric keys '0'...'9', '*', '#' during a connection (see CHAPTER 4.3.4).

NOTICE   Since the Shift key ('#') is used for shifting between the two B channels (only in ISDN operating mode), you must keep the key pressed for 1 second to send the '#' DTMF tone.

8.1.2   Sending DTMF tones via the MAGIC TH2 Keypad

The sending of DTMF tones using the **MAGIC TH2 Keypad** is described on Page 86. To activate the option for sending DTMF please use the **Shift** key.

8.1.3   DTMF call initiation via the Audio inputs

You can also initiate a call using DTMF tones via the Audio inputs of the system. You simply need to send the DTMF tones from an external DTMF generator to the Audio input of the **MAGIC TH2**. To signalise to the system that the number is complete, you need to send the dialling command via a TTL-Pin (see Page 58, TTL-Pin as input → Connect via DTMF/Accept Call In).

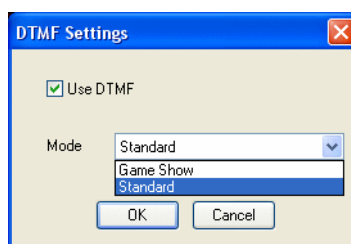**FIG. 59   DTMF CALL INITIATION VIA THE AUDIO INPUTS**

Switch/push button to initiate the call

DTMF via Audio Channel 1   DTMF via Audio Channel 2

---
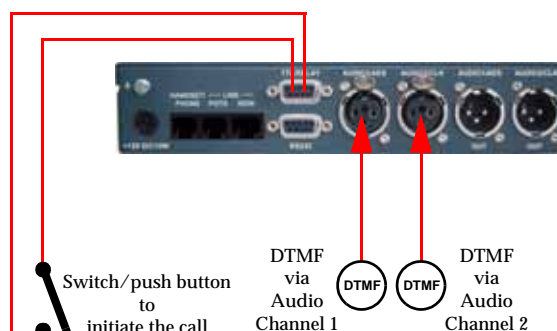
[1]   DTMF = Dual Tone Multi-Frequency

8.2   **DTMF PC functions**

To configure the DTMF function via PC, select the submenu *Configuration → DTMF Settings*.

FIG. 60   DTMF SETTINGS

To activate the PC DTMF function check the box for *Use DTMF*. Subsequently, the DTMF function is displayed in the main window.

FIG. 61   MAIN WINDOW WITH ENABLED DTMF FUNCTION

DTMF Analysis
in channel 1/2

Reset the
DTMF display

Sending DTMF
tones via
channel 1/2
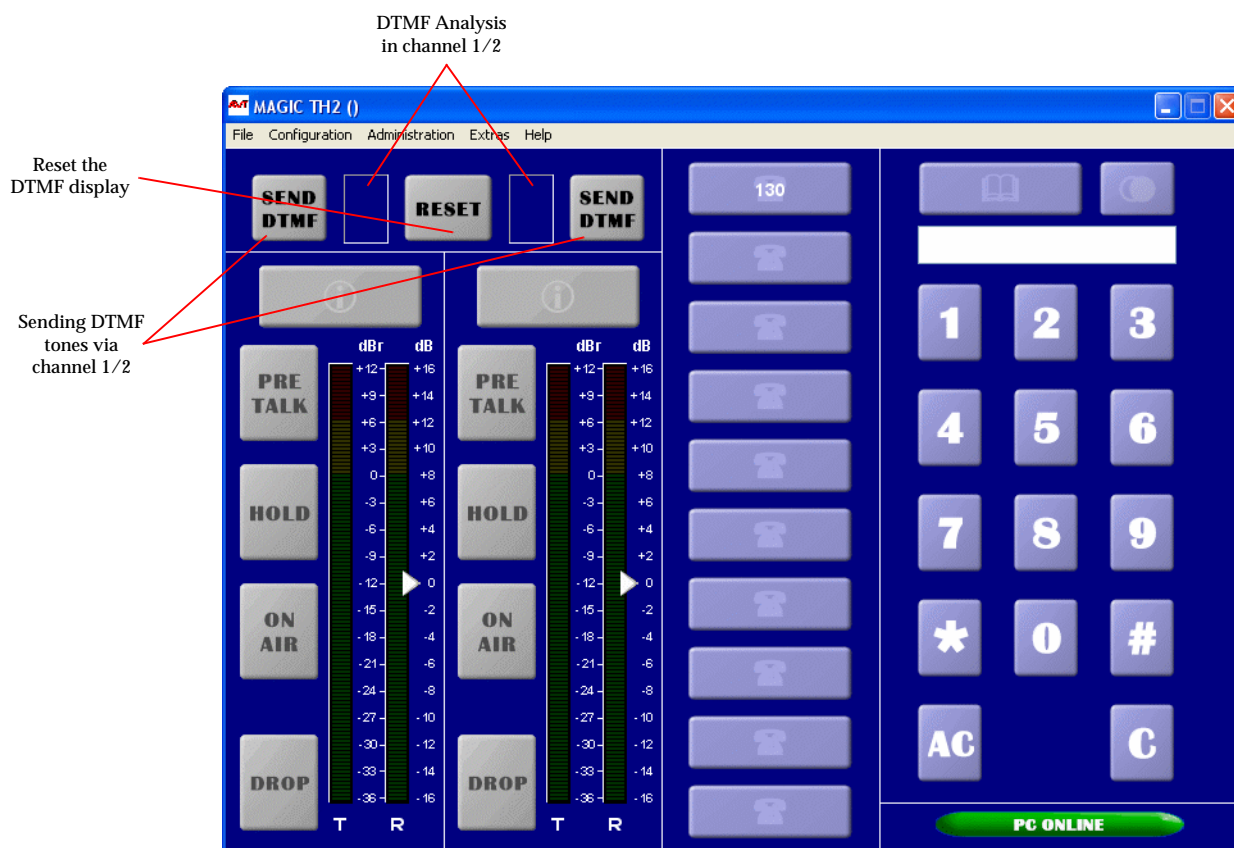
In the DTMF settings under *Mode* there are two options for the analysis of DTMF tones available:

(1)   *Standard*: Each key pressed on the phone of the partner is displayed as cypher. The button *RESET* resets the display

FIG. 62   **DTMF STANDARD MODE**

(2)   *Game Show*: This configuration is useful if you play a game with two partners at the same time, in which you ask a question and the partners give their answers by pressing a key on their telephones. The partner who pressed the key first is displayed via a field marked in green and the cypher pressed. In this way, it is easy to determine who was the first to give the right answer. A re-pressing of a key on the telephones of the partners is ignored by the system. A new analysis is not carried out before the button *RESET* is used and the display has been reset.

FIG. 63   **DTMF GAME SHOW MODE**

To send DTMF tones to a partner please press the key *SEND DTMF* and use the numerical pad. The key *SEND DTMF* can only be used during a connection.

FIG. 64   **DTMF GAME SHOW MODE**
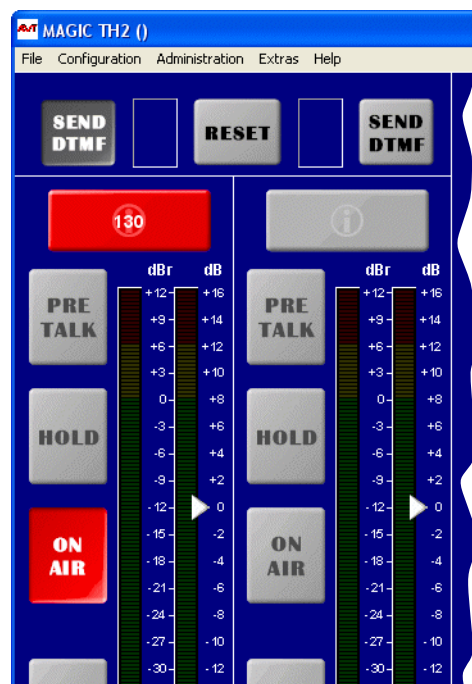
A1   **M E N U   S T R U C T U R E**

On the following pages you will find the complete menu structure if you se-lect English as your menu language.

From the main menu you reach the phone book directly via the softkey Names. If you use the softkey Menu you go to the configuration of the system.

The configuration menu again is divided into five submenus:

– System Settings

– Operation Settings

– Presets

– Status Information

– Login

NOTICE Please notice that some menu items may not be displayed depending on the selected operating mode.

If you use an Administrator and/or a User Password, the display looks as it is described below:

(1) Only **Administrator Password** configured: The password must be en-tered for changes to the System Settings and Operation Settings only. Immediately available menus:

  – Presets

  – Status Information

  – Login

(2) Only **User Password** configured (instead of Menu, Login is displayed): The password must always be entered. Subsequently, all menus are available.

(3) **Administrator** and **User Password** configured (instead of Menu, Login is displayed):

  – **User Password** is entered: The menus Presets, Status Information and Login are available

  – **Administrator Password** is entered: All menus are available.

NOTICE There is no differentiation between upper and lower case for the password entry.
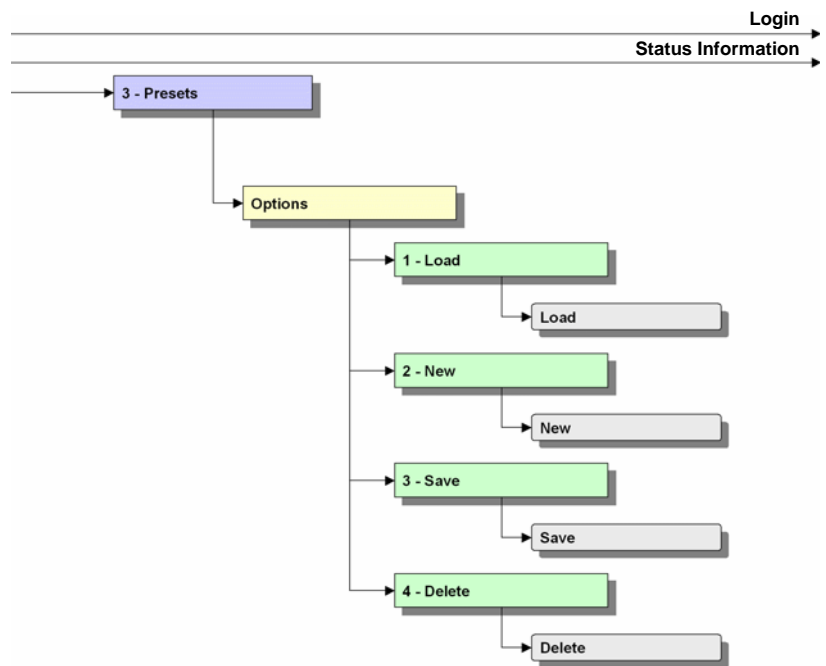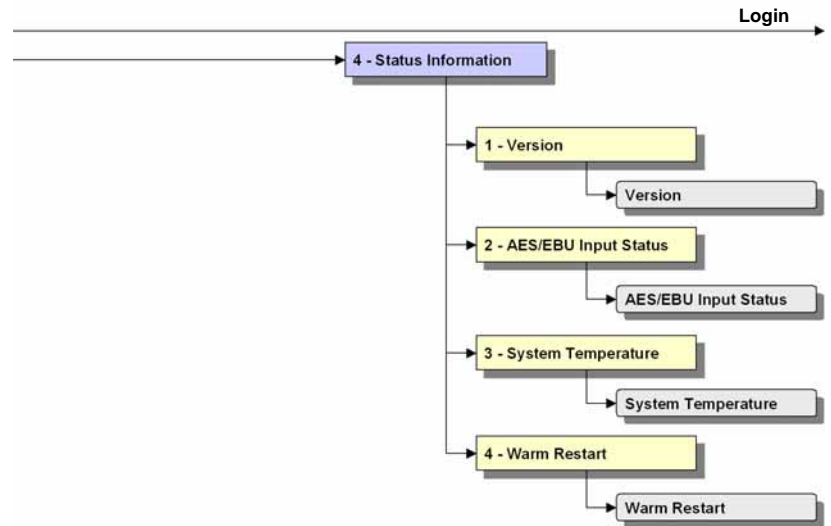
A1.1   System Settings

Menu

1 - System Settings

1 - Display

1 - Contrast

Contrast

2 - Backlight

Auto
On

2 - Keypad

Key Tone

3 - Audio

1 - Audio Interface In

Analogue
Digital

2 - Audio Interface Out

Analogue
Digital

3 - ON AIR Level In

ON AIR Level In

4 - ON AIR Level Out

ON AIR Level Out

5 - Handset Level In

Handset Level In

6 - Handset Level Out

Handset Level Out

7 - AES/EBU Clock Source

Internal
External
Recovered

4 - PRETALK Inteface

No Device
Phone
Handset

5 - RS232

Keypad 9600, None
PC 19200, None
PC 38400, None

6 - Date/Time

Date/Time

7 - Language

English
Deutsch

8 - Remote Control

1 - Enable Remote Control

Enable Remote Control

2 - Remote Control Password

Remote Control Password

3 - Authorised Number

Authorised Number

A1.2   Operation Settings

2 - Operation Settings

1 - Line Mode
- POTS
- ISDN
- ISDN Single Hybrid

2 - ISDN or POTS

1 - Auto Answer
- Off
- Current Audio Line
- HOLD
- PRETALK
- ON AIR

2 - Prefix Number
- Prefix Number

3 - MSN 1
- MSN 1

4 - MSN 2
- MSN 2

5 - Internal No. Length
- Internal No. Length

6 - Prefix on Callin
- Skip

7 - Default Audio Line
- Off
- PRETALK
- HOLD
- ON AIR

3 - Ring Tone

1 - System Ring Tone
- System Ring Tone

2 - Handset Ring Tone
- Handset Ring Tone

4 - Signal Processing

1 - AGC Enable
- AGC

2 - Echo Canceller
- Off
- Auto
- On

3 - Expander
- Expander

4 - AGC/Expander Thresh.
- AGC/Expander Thresh.

5 - AGC Level
- AGC Level

6 - AGC Speed
- Slow
- Middle
- Fast

5 - Audio Monitoring

1 - Pretalk Monitor
- Pretalk Monitor

2 - OnAir Monitor Caller
- OnAir Monitor Caller

3 - OnAir Monitor Input
- OnAir Monitor Input

4 - Drop Monitor
- Drop Monitor

6 - Equalizer

1 - Bass Boost
- Bass Boost

2 - Treble Boost
- Treble Boost

3 - Bass Boost Frequency
- 50 Hz
- 100 Hz
- 200 Hz

7 - 50 Hz Filter (POTS)
- 50 Hz Filter

8 - HOLD Signal Source
- ON AIR
- Recorded HOLD Signal

A1.3   **Presets**

A1.4   Status information

A1.5   Login

A1.6   **Names**
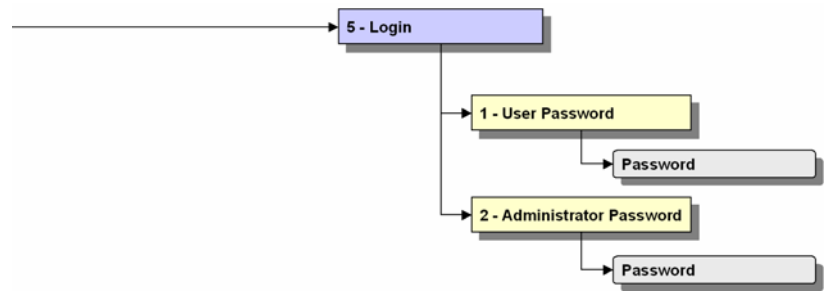
A 2 ERROR CORRECTION
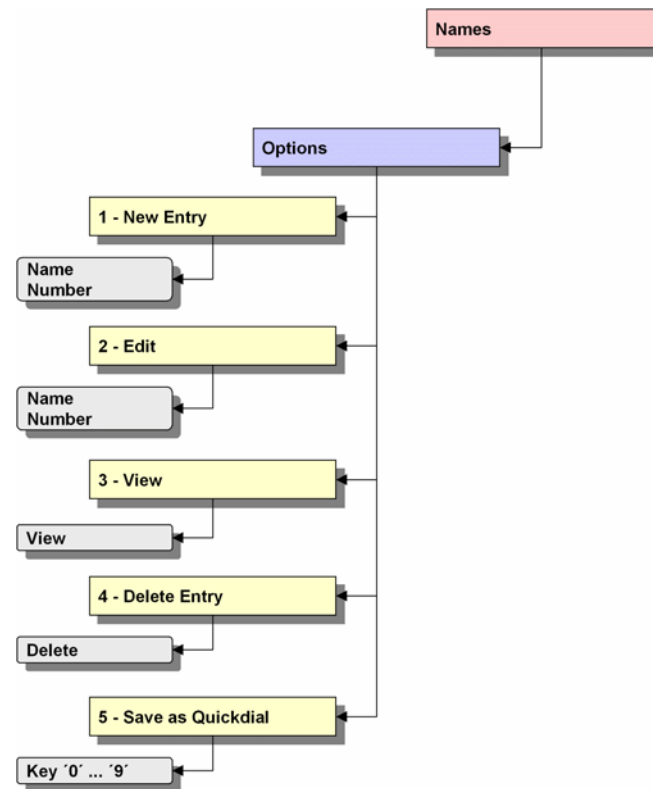
TAB. 4	ERROR CORRECTION
Problem	**Possible cause and correction**
On the analogue telephone line no external connection can be established.	If you operate the system with a private branch exchange, a prefix number must be entered (see Page 42).
A radio signal is received in the analogue operating mode.	Please check if the POTS line is twisted. The system must be earthed via the earthing screw (see Page 21.)
There is a humming in the analogue operating mode.	Please enable the 50 Hz filter. The humming is injected via the POTS connection (see Page 41).
The Echo Canceller does not work.	If you switch callers via a Call-In Center to the hybrid the Echo Canceller is possibly adjusted incorrectly. Enable the Echo Canceller permanently (see Page 44). Please notice that echoes of more than 32 ms cannot be filtered out anymore.

A 3   I N T E R F A C E S

The interfaces of the systems are pictured in Fig. 65.

FIG. 65   REAR VIEW OF THE MAGIC TH2 TELEPHONE HYBRID

All interfaces are described below.

A3.1 ISDN and analogue telephone interfaces

A3.1.1 S_0 interface

This interface supports two B channels in ISDN networks with EURO ISDN (DSS-1) Protocol.

1   8
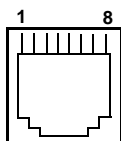
TAB. 5   PIN ASSIGNMENT: S_0 INTERFACE (LINE ISDN)

Socket: Western (8-pole) RJ45

Pin	Signal		Electrical characteristics
1	not used		Recommendation: I.430
2	not used		Data rate: B channel: 2x64 kbit/s
			D channel: 16 kbit/s
3	TX a	Data out a	
4	RX a	Data in a	
5	RX b	Data in b	
6	TX b	Data out b	
7	not used		
8	not used		

A3.1.2 POTS[1] interface

This interface is used for the connection to a analogue telephone line. A cable set for phone jacks is included in the delivery.

1   6
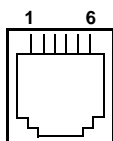
TAB. 6   PIN ASSIGNMENT: ANALOGUE POTS TELEPHONE INTERFACE (LINE POTS)

Socket: Western (6-pole) RJ12

Pin	Signal	Electrical characteristics
1	not used	Typical characteristics:
2	not used	Bandwidth: 300 - 3.3 kHz
3	TEL LINE a	Signal to noise ratio: 45 dB
		Average level: -9 dBm (275 mV)
4	TEL LINE b	Impedance: 600 ohms
		DC voltage: 48 V (±6 V typ)
5	not used	DC current: 20-26 mA (typ)
		Ringing voltage 90 Vrms
6	not used	Ringing frequency: 20 Hz (2 Sec. on, 4 Seek. off)

---

[1] POTS = Plain Old Telephone Service

A3.1.3 Handset/Telephone interface

To this interface you can connect a telephone handset/headset for the PreTalk.

ATTENTION

Pin assignment not standardised
Please notice that the Pin assignment of the telephone receivers is not standardised. Additionally, it is important to consider the correct polarity of the Phantom Power.

If you connect an analogue telephone, please use Pin 3 + 4 only.

Please use 6-pole RJ12 Western connectors only since if a 4-pole Western connector is used several contacts can be bent.

An analogue telephone, telephone handset and headset are optionally available.

In the **_analogue POTS operating mode_** it is also possible to connect a standard analogue telephone, through which the connection can be established and the Pre Talk be carried out.

1   6
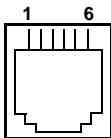
TAB. 7   PIN ASSIGNMENT: ANALOGUE TELEPHONE /HANDSET INTERFACE (HANDSET/PHONE)

Socket: Western (6-pole) RJ12

Pin	Signal	Electrical characteristics
1	HANDSET OUT a	Microphone: Impedance: ~ 2 kOhm Sensitivity: ~ -60 dB @ 1-kHz
2	HANDSET OUT b	
3	TELEPHONE a	Telephone receiver: Impedance: ~150 Ohm Sensitivity: ~ 97dB @ 1-kHz
4	TELEPHONE b	
5	HANDSET IN a/+5V phantom power	
6	HANDSET IN b	

A3.2   **Control Interface**

A3.2.1   **RS232 interface**

The RS232 interface is used for the configuration and the operation of the *MAGIC TH2* Telephone Hybrid System via a PC. Because of future data transmission applications this interface is designed as DCE (Data Communication Equipment). To connect a PC you need a 1:1 connecting cable, in which Pin 2 and Pin 3 are ***not*** crossed. Additionally, Pin 5 GND must be connected. The remaining Pins are not used.

NOTICE   Please notice that the function - input or output - of the Pins RXD and TXD is determined by the interface type DCE or DTE. The Pin assignment is always RXD for Pin 2 and TXD for Pin 3.
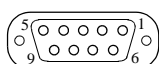
TAB. 8	PIN ASSIGNMENT: RS232 INTERFACE (RS232)		
Socket: SUB-D, 9-pole			
Pin	**Signal**		**Electrical characteristics**
1		not used	Type: DCE[a]
			Level: V.24
2	RXD[b]	Receive Data	Data rate: 38400 Baud
			Range: max. 15 m
3	TXD[c]	Transmit Data	Protocol: 1 Start bit
			8 Data bits
4		not used	1 Stop bit
5		not used	
6		not used	
7		not used	
8		not used	
9		not used	

a   DCE = Data Communication Equipment: to connect a PC a 1:1 cable is required

b   ATTENTION: on this Pin the MAGIC TH2 **transmits** data

c   ATTENTION: on this Pin the MAGIC TH2 **receives** data

A3.2.2   **TTL/RELAY interface**

Via this interface external control signals can be used.
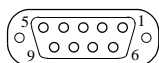
TAB. 9	PIN ASSIGNMENT: TTL/RELAY INTERFACE (TTL/RELAY)	
Socket: SUB-D, 9-pole		
Pin	**Signal**	**Electrical characteristics**
1	+5V/300mA Output	
2	TTL 1 IN/OUT	Capacity of the TTL outputs:
		Maximum voltage: 5V
3	TTL 2 IN/OUT	Maximum current: 10mA
4	TTL 3 IN/OUT	
5	GND	
6	Relay 1a	Capacity of the relays:
		Maximum voltage: 48V
7	Relay 1b	Maximum current: 200mA
8	Relay 2a	
9	Relay 2b	

| A3.3 | Audio interfaces |

The standard system incorporates analogue and digital AES/EBU Audio interfaces. The interfaces can be set via the front display and keypad or via the PC software.

| A3.3.1 | Analogue Audio interface |
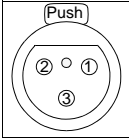
TAB. 10   PIN ASSIGNMENT: ANALOGUE INPUT (AUDIO 1/2 IN)

Socket: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	Incoming level: adjustable -3 .... +9 dBu
2	AUDIO IN a	Impedance: > 25 kΩ
3	AUDIO IN b	Head room: 6 dB
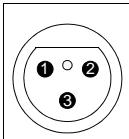
TAB. 11   PIN ASSIGNMENT: ANALOGUE OUTPUT (AUDIO 1/2 OUT)

Connector: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	Outgoing level: adjustable -3 .... +9 dBu
2	AUDIO OUT a	Impedance: < 50 Ω
3	AUDIO OUT b	Head room: 6 dB

| A3.3.2 | Digital AES/EBU Audio interface |

The *MAGIC TH2* Telephone Hybrid incorporates optional two digital Inputs/Outputs which are physically one AES/EBU interface. The input as well as the output has a digital sample rate converter providing that a digital source with 32, 44.1 or 48-kHz can be connected directly. For external clocking (48-kHz only) the word clock input or output may be used.
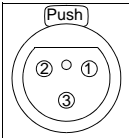
TAB. 12   PIN ASSIGNMENT: DIGITAL INPUT (AES IN)

Socket: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	IEC-958
2	AUDIO IN a	
3	AUDIO IN b	
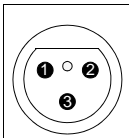
TAB. 13   PIN ASSIGNMENT: DIGITAL OUTPUT (AES OUT)

Connector: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	IEC-958
2	AUDIO OUT a	
3	AUDIO OUT b	
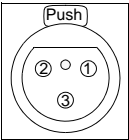
TAB. 14   **PIN ASSIGNMENT: CLOCK INPUT (CLK IN)**

Socket: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	TTL
2	CLOCK IN	
3	not used	
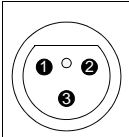
TAB. 15   **PIN ASSIGNMENT: CLOCK OUTPUT (CLK OUT)**

Connector: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	TTL
2	CLOCK OUT	
3	not used	

A3.4   **Power supply interface**

The power supply is connected via an external power supply adapter.
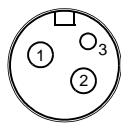
TAB. 16   PIN ASSIGNMENT: POWER SUPPLY

Socket: KYCO KPJ-S3

Pin	Signal	Electrical characteristics
1	GND	Voltage: +12V
2	+12V	Power: max. 15W
3	not used	

A4   TECHNICAL DATA MAGIC TH2

CODING ALGORITHMS

- G.711   A-Law   3,1-kHz (Telephone algorithm)

LINE INTERFACES:

- ISDN

    - 1 x S_0 I.430   RJ45
    - Protocol   DSS-1
- POTS

    - 1 x POTS   RJ12
- Telephone/Handset interface

    - 1 x POTS   RJ12

CONTROL INTERFACES

- RS232   V.24   9-pol. SUB-D   socket

- TTL/RELAY   9-pol. SUB-D   socket

    - 2 x Relay   function can be programmed
      Capacity   48V/200mA
    - 3 x TTL Input/Output   function can be programmed

      Capacity   5V/10mA

AUDIO INTERFACES

Analogue Audio 1/2:

- Electronic, balanced input   XLR female

- Electronic, balanced input   XLR male

- Nominal level   -3 ... +9 dBu   (can be programmed)

- Head room   6 dB

- Impedance   Input: > 25 kΩ
                           Output: < 50 Ω

- Frequency response   50 Hz ... 3400 Hz

– Linearity	< 0,2 dB		
– Signal to Noise Ratio	< - 110 dB		
– Noise	< -70 dB		
– Crosstalk Audio 1/2	> 70 dB		

Digital Audio AES/EBU:

– Format	IEC-958	AES/EBU Professional	
– Balanced input		XLR female	
– Balanced output		XLR male	
– Impedance	Input:	110 Ω	
	Output:	110 Ω	
– Clock input	TTL/75 Ω	XLR female	
– Clock output	TTL/75 Ω	XLR male	
– Separate Sample Rate Converter for Input/Output			

Handset/Headset:

– Electronic, balanced input		RJ12 socket	
– Electronic, balanced output		RJ12 socket	
– Input amplifier	~ 10 dB		
– relative Input level	-24 ... +6 dBr	(can be programmed)	
– relative Output level	-6 ... +6 dBr	(can be programmed)	
– Head room	6 dB		
– Impedance	Input:	> 25 kΩ	
	Output:	< 50 Ω	

SIGNAL PROCESSING

– AGC per B channel, configurable

– Level adjustment control during connection: -16 dB ... +16 dB

– Echo Canceller per B channel (256 taps, 32ms Echo cancel time)

– Expander per B channel, configurable

DISPLAY

- graphical resolution 160 x 32 Pixel

- illuminated (can be switched off)

POWER SUPPLY VIA EXTERNAL ADAPTER

Direct Voltage (DC)

– + 12 V

Power Consumption

– max. 15 W

DIMENSIONS

H x W x D

– 44 x 220 x 220 mm

WEIGHT

– ca. 1,7 kg

ADDITIONAL INFORMATION

EMC

– EN 55103

Electric safety

– EN 60950

Temperature Range

– +5 °C to 45 °C

Relative humidity

– 5% is 85%

A 5   T E C H N I C A L   D A T A   M A G I C   T H 2   K E Y P A D

A5.1   **Keypad**

Matrix: 8 x 6

(32 keys 4 quad keys, 4 double keys, 24 single keys)

FIG. 66   CONNECTING CABLE MAGIC SYSTEM - KEYPAD

to power supply adapter

to MAGIC TH2 Hybrid   to Keypad
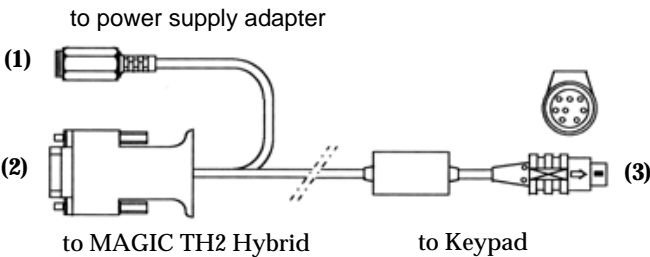
Protocol:

9600 Baud
no parity

Connection to external power supply adapter (1):

6-pol. Mini-DIN connector
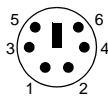
Assignment:

Pin 3:   GND (Ground)
Pin 4:   +5V

Connection to MAGIC TH2 (2):

9-pol. SUB-D connector
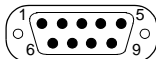
Assignment:

Pin 2   RXD
Pin 3   TXD
Pin 5   GND (Ground)

Connection to keypad (3):

8-pol. MINI DIN connector

Assignment:

Pin 2:   clock
Pin 3:   +5V
Pin 4:   Data
Pin 5:   GND (Ground)

A5.2   **LCD Display**

2 x 20 characters

illuminated

A5.3   **Power supply:**

5V, max. 500 mA

Connection:

6-pol. Mini-DIN socket

Assignment:

Pin 3:   GND (Ground)
Pin 4:   +5V
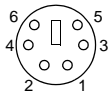
A 6　　G E N E R A L

A6.1　　Order numbers

MAGIC TH2 Telephone Hybrid	800201
Windows PC Software Update	430191[1]
Optional:	
AES/EBU Interface	430230

Accessories

MAGIC TH2 Hybrid Keypad	800200
MAGIC TH2 DUAL 19" Mounting Kit	800202
MAGIC TH2 Telephone Handset with Handset Rest	800203
MAGIC TH2 Telephone Headset	800204
POTS Telephone with Display[2]	490101

Software Options

DTMF Generator & Analyser Plug-In	430200
Remote Control & ISDN Monitor Plug-In	430214

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[1]　also available in the internet under this identity number

[2]　only reasonable for the POTS operating mode

A6.2 **Scope of delivery**

– MAGIC TH2 Telephone Hybrid

    – CD Windows PC Software   430188

    – External Power Supply Adapter

        Input: 100 - 240V / 24W, 50 - 60 Hz

        Output: 12V

    – Self adhesive feet

    – 19'' Mounting brackets

    – Manual

    – 1 x S_0 cable

    – 1 x POTS telephone cable

A6.3 **Declaration of conformity**

The declaration of conformity you will find at the end of this manual.

A 7   S E R V I C E   I N F O R M A T I O N

A7.1   Software Updates

Free Software Updates you will find on our Homepage under

http://www.avt-nbg.de

Go to **Service** and click on the menu item **Software**-**Download**.

The Identity Number of the **MAGIC TH2** Update Software is:

430191

A7.2   Support

You can contact our Support Hotline during the normal office hours between 09.00h - 17.00h (GMT+1) under the following telephone number:

+49 911 5271 160

or via E-Mail under

support@avt-nbg.de

To deal with your problem efficiently please note the factory number of the unit as well as the software version that you use.

A7.3   Repairs

If, contrary to expectations, your unit is defective please fill in the attached status report and send the unit to the following address:

AVT Audio Video Technologies GmbH
- **Repairs** -
Nordostpark 12
D-**90411 Nuernberg**
Germany

I N D E X

![AVT Audio Video Technologies]

C E-Konformität

DECLARATION OF CONFORMITY

Declaration of Conformity (vertical side text)

Name des Anbieters:
Supplier's name:

AVT Audio Video Technologies GmbH

Anschrift des Anbieters:
Supplier's address

Nordostpark 12
D-90411 Nürnberg

erklärt, daß das Produkt
declares, that the product

Produktname(n):
Product name(s):

MAGIC TH2 Telefonhybrid   450054
MAGIC TH2 Telephone Hybrid   450054

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:
conforms to the standards of the following European directives:

Nummer/Text:
Number/title:

EN 60950 A4 Gerätesicherheit

Die Übereinstimmung wird nachgewiesen durch vollständige Einhaltung folgender Normen:
The conformity is evidenced by strictly meeting the following standards:

Harmonisierte Normen:
Harmonized Standards:

EN 55022, EN 55024,
EN 300386,
FCC Part 15 B

Ort, Datum:
Place, date:

Nürnberg, 24.09.2004

Name(n):
Name:

Wilfried Hecht

Rechtsverbindliche Unterschrift(en):
Legally binding signatures:

Telefon:
Phone:

+49 911 5271-120

Diese Erklärung beinhaltet keine Zusicherung von Eigenschaften.
This declaration includes no warranty of properties.

Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
The safety instructions specified in the product documentation delivered must be observed.